2014 Annual Report of

Wildlife Research in the NWT

Photo: GNWT/J. Adamczewski, ENR

Northwest Territories Environment and Natural Resources

Photo: GNWT / J. Soering, ENR

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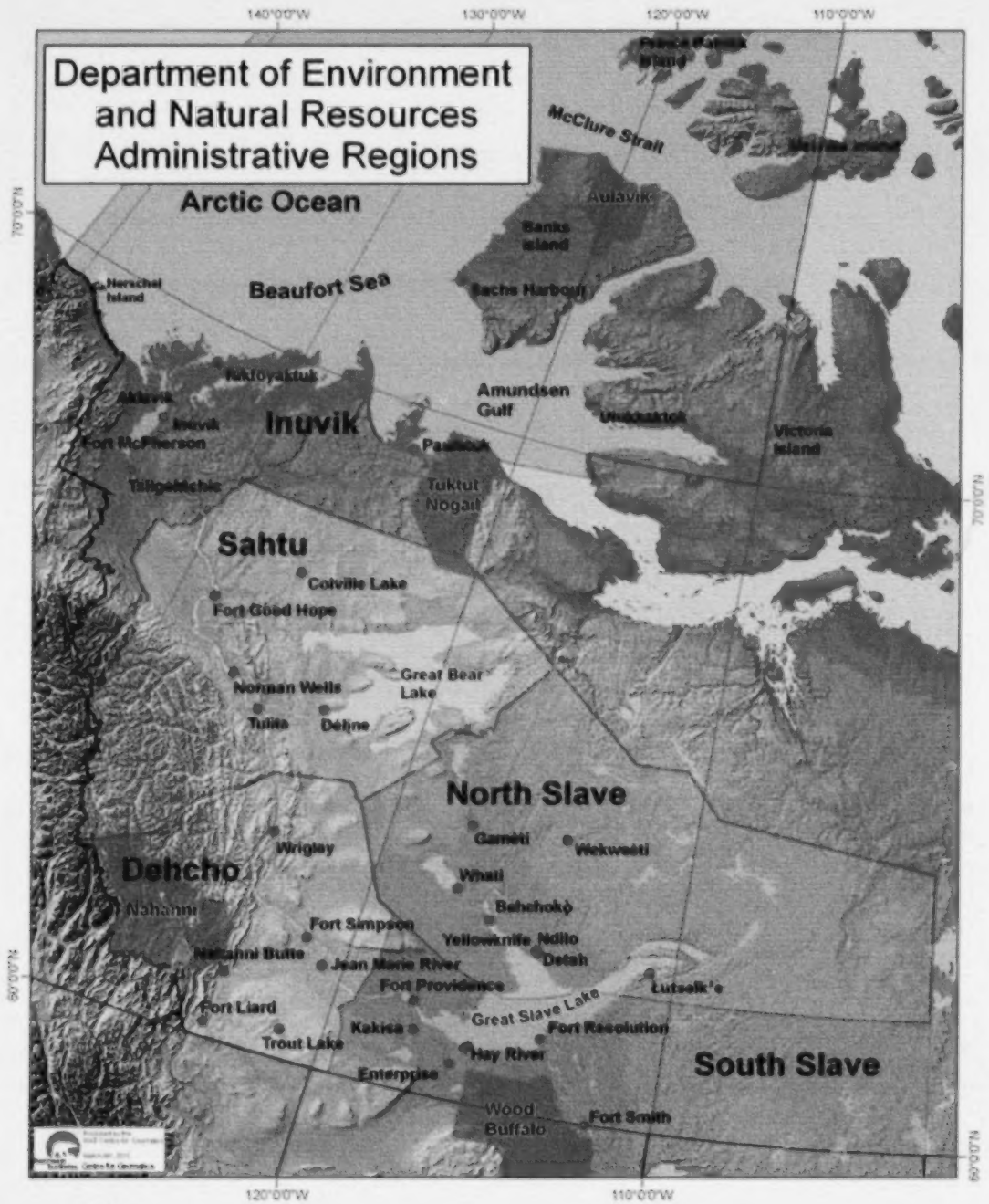
ENR Administrative Regions of the NWT



Northwest Territories

2014 Annual Report of Wildlife Research in the NWT

INTRODUCTION

Under section 84(1) of the *Wildlife Act* SNWT 2013, c.30, a valid Wildlife Research Permit is required to conduct research on wildlife or collect wildlife specimens in the Northwest Territories (NWT). It is an offence to conduct a survey or census of wildlife or wildlife behaviour, administer drugs, collect or purchase specimens, or carry out any scientific research relating to wildlife without a permit.

The Government of the Northwest Territories (GNWT) Department of Environment and Natural Resources (ENR) is responsible for issuing Wildlife Research Permits. Each year, researchers carry out studies on all types of wildlife and wildlife habitat throughout the NWT. As a requirement of an NWT Wildlife Research Permit, researchers must submit a summary report of their activities and findings to ENR.

Studies receiving funding from the Western NWT Biophysical Study also require a Wildlife Research Permit and report because they relate to wildlife and wildlife habitat research. The Western NWT Biophysical Study was established to help ensure baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the western NWT is available to industry, regulators, communities and government. The program focuses on areas within the mandate of the ENR: wildlife; wildlife habitat; forests; and, air quality.

The Western NWT Biophysical Study provided $390,000 towards projects in 2014/2015. In addition to research projects, workshops are held in each of the Mackenzie Valley regions to review progress of the Study and ensure priority information needs are being addressed. Partnerships with federal agencies, wildlife management boards, universities, non-government organizations and industry have been developed on a project-by-project basis. Most projects involve multiple partners.

This publication provides summary reports for wildlife research and biophysical studies carried out during 2014. Contact information for the main investigator leading each project has been included if you wish to obtain more information on a specific project. For more information on wildlife research in the NWT, please go to www.enr.gov.nt.ca or contact your local or regional Environment and Natural Resources office.

DISCLAIMER

The contents of each summary are the sole responsibility of the team leads for each project and do not reflect any official policy of ENR or the GNWT.

Bat Research and Monitoring in the South Slave Region

February 2013 – February 2014

MAIN INVESTIGATORS:

Allicia Kelly, Manager Research and Monitoring, and Karl Cox, Wildlife Technician, Environment and Natural Resources, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500111

LOCATION:

Throughout the South Slave region but predominately in the Fort Smith area.

PARTNERS:

- Fort Smith Métis Council
- Fort Resolution Métis Council
- Ka'a'gee Tu First Nation
- Salt River First Nation

CONTACT:

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RATIONALE:

Bats play a critical role in the environment as the primary consumer of night-time insects. Little information exists about bat distribution and ecology in the NWT. The South Slave region is home to important bat hibernation habitat. Documenting overwintering sites in the South Slave region will provide information on local bat populations and help the NWT to predict, monitor and mitigate environmental impacts and cumulative effects on bats, especially in regards to White-nose Syndrome (WNS).

OBJECTIVES:

- To determine bat species diversity in the South Slave region (specifically Kakisa and Fort Smith areas).
- To establish baseline bat data for key bat areas in the South Slave region.
- To document known bat overwintering sites (use by bats, temperature/humidity profiles, resource inventories, etc.).
- To take samples from bats to test for *Geomyces destructans* (WNS).

METHODS:

Bat detectors record echolocation. Some bat species can be identified by the pattern of their echolocation. Acoustic detectors were used to record bat presence in various habitats (but primarily around hibernacula sites).

Baseline data collection and ongoing monitoring of hibernacula is led by regional ENR staff. Overwintering bat counts in hibernacula were completed and a subset of bats was swabbed for testing for WNS.

RESULTS AND MAIN CONCLUSIONS:

All samples for WNS were determined to be negative. No sign of the fungus has been observed. The bat population in known hibernacula appeared to be comparable in size to last year, though additional years of population data will be needed to establish any sort of trend. Temperature and humidly data, as well as acoustic data is pending analysis.

LONG-TERM PLANS AND RECOMMENDATIONS:

The little brown bat *(Myotis lucifugus)* has been listed as endangered by the Committee on the Status of Endangered Wildlife in Canada. It is recommended ENR continue to document bats in the regions and build baseline data prior to the predicted arrival of WNS. Work is ongoing on developing cave management plans which will help address preservation of important bat habitat in the NWT.

COMMUNITY INVOLVEMENT:

Traditional knowledge and community involvement is used wherever possible.

Photo: GNWT/K. Cox, ENR

Banded bat located during 2013 hibernaculum count.

Arctic Shorebird Monitoring Program

June 2014 – July 2014

MAIN INVESTIGATOR:

Jennie Rausch, Shorebird Biologist,
Canadian Wildlife Service, Environment Canada

WILDLIFE RESEARCH PERMIT:

WL500252

LOCATION:

Mackenzie Delta, Inuvialuit Settlement Region, NWT (Intensive Surveys).
Queen Elizabeth Islands, Inuvialuit Settlement Region, NWT (Rapid Surveys).

PARTNERS:

- Canadian Wildlife Service, Environment Canada (CWS)
- Program for Regional and International Shorebird Monitoring (PRISM)
- Manomet Centre for Conservation Sciences
- Neotropical Migratory Bird Conservation Act (USA government)
- Center for Conservation Biology (The College of William and Mary and Virginia Commonwealth University, Virginia, USA)
- Polar Continental Shelf Program, Natural Resources Canada

CONTACT:

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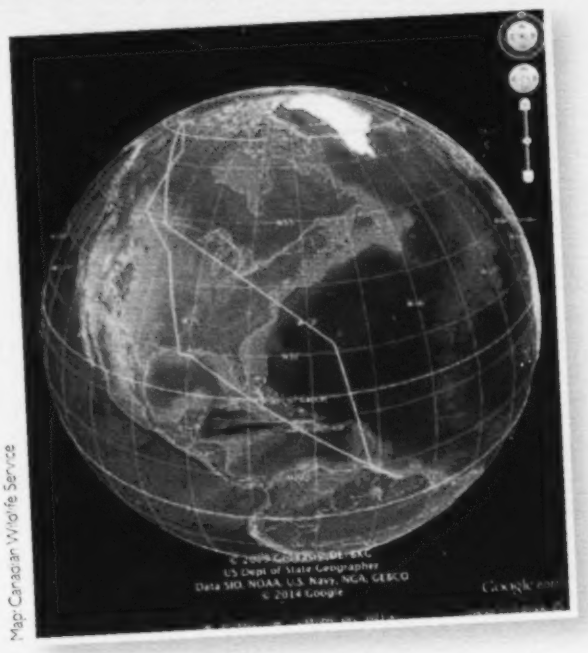
RATIONALE:

The Arctic Shorebird Monitoring Program was initiated in response to widespread shorebird population declines noted on migration routes through southern Canada and the United States. In order to identify the causes of this decline, it is critical to study shorebird populations and population dynamics on their breeding grounds, where more accurate population estimates and demographic information can be obtained.



Preliminary results from geolocator recovered from a semipalmated sandpiper in 2014. The green line depicts the bird's route from the breeding grounds in the Mackenzie Delta following deployment of the device in 2013, over the Atlantic Ocean to the wintering grounds in South America and return to the Mackenzie Delta in 2014.

OBJECTIVES:

This project is part of a larger program called the Arctic Program for Regional and International Shorebird Monitoring (Arctic PRISM). The purpose of the program is to:

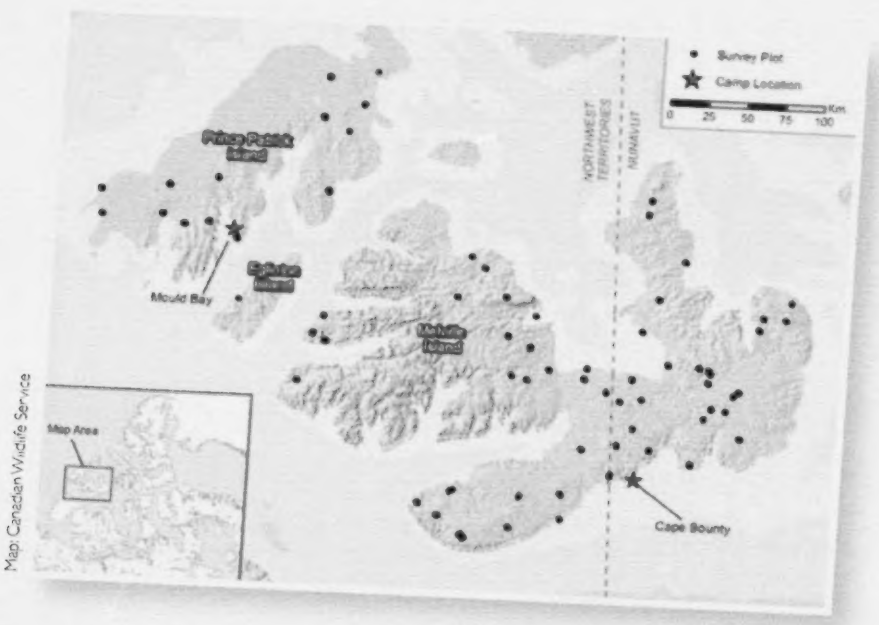
- generate population estimates for all Arctic breeding shorebirds;
- produce maps of shorebird distribution and abundance across the North American Arctic;
- identify highest-quality habitats for each shorebird species;
- provide shorebird densities and breeding ecology information at each survey site; and,
- assist local managers in meeting their conservation goals.

METHODS:

Our work involves two different survey types – short term snap shot surveys, or "rapid surveys" conducted over broad areas, and long-term, high resolution "intensive" surveys conducted in a localized area.

Rapid Surveys – These surveys involve two people walking systematically through a 12 ha plot and recording all the birds and nests they see. Plots are accessed by helicopter and surveyed by foot. We conducted surveys at plots located on Prince Patrick, Melville and Eglinton Islands.

Intensive Surveys – In the Mackenzie Delta, several large plots were surveyed for shorebirds and their nests. Nesting and hatching success were monitored at five-day intervals. Adult and juvenile shorebirds were captured and fitted with stainless steel and colour bands. Additionally, some whimbrels were fitted with backpack-mounted satellite transmitters.



Location of plots surveyed in the western Queen Elizabeth Islands in 2014. The red stars indicate camp locations, black points represent plot locations.

Map: Canadian Wildlife Service

Mackenzie Delta site, showing study area within the Kendall Island Migratory Bird Sanctuary.

LONG-TERM PLANS AND RECOMMENDATIONS:

In 2015, we are shifting the location of our intensive surveys to a new site in Nunavut and do not plan to return to the Mackenzie Delta until 2020. We plan to conduct rapid surveys in the lower mainland area of the NWT and Nunavut in 2015.

COMMUNITY INVOLVEMENT:

Over the last ten years, the CWS Shorebird Program has hired nine students from northern communities to work as part of our field team. This year, as part of CWS's mentoring program in Nunavut (Inuit Field Research Assistant Program), we hired a student from Iqaluit, NU.

RESULTS AND MAIN CONCLUSIONS:

Rapid Surveys – A total of 174 plots (2,088 ha) were surveyed from June 19-26. Many of the plots surveyed this year had extensive snow cover and had few birds as a result.

Intensive Surveys – A total of 90 shorebird nests were observed at the Mackenzie Delta this year: 49 are known to have hatched; 30 are known to have failed; four where the fate is unknown; and, seven were still active at the time of our departure. Seventy-two adult shorebirds and 59 chicks were banded. We also re-sighted 16 shorebirds that had been banded in previous years, and re-captured ten. We recovered a geolocator from a recaptured semipalmated sandpiper and deployed six new satellite transmitters on whimbrels.

Photo: T. Kydd, Canadian Wildlife Service

Geolocator on semipalmated sandpiper recaptured in the Mackenzie Delta prior to removal.

Photo: F. Smith, Canadian Wildlife Service

Whimbrel fitted with backpack-mounted satellite transmitter (antennae visible in photo) and leg bands.

Bank Swallow – Mackenzie and Arctic Red River Survey – Species at Risk Stewardship

18 September 2014 – 01 December 2014

MAIN INVESTIGATOR:

Leighanne Lennie, Coordinator,
Gwichya Gwich'in Renewable Resources Council

WILDLIFE RESEARCH PERMIT NUMBER:

WL500275

LOCATION:

Surveys will be conducted on the river by boat, ~30 km north and south of Tsiigehtchic, NWT, along the Mackenzie and Arctic Red Rivers.

PARTNERS:

- Species at Risk Stewardship Program
- Gwich'in Renewable Resources Board

CONTACT:

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Gwichya Gwich'in Renewable Resources Council
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RATIONALE:

We propose to survey the Mackenzie and Arctic Red Rivers, ~30 km up and down from Tsiigehtchic, via motor boat, to document bank swallow colonies. We will take youth during surveys and use binoculars to spot colonies. We will get an approximate number of nests at each colony, take GPS coordinates and photographs and note habitat characteristics. Our final report will include a map with locations of colonies, number of birds and active nests seen per colony. This work will help fill in the gap for bank swallow population estimates in northern Canada and will, hopefully, be re-sampled each year.

OBJECTIVES:

- To encourage involvement in stewardship activities through outreach, education and awareness-building.
- To increase stewardship-related knowledge and skills of landowners or other groups.
- To increase knowledge and education on bank swallows within the Gwich'in settlement area.
- To document colony sites and population numbers of bank swallows around Tsiigehtchic.

METHODS:

Three days of ~30 km survey routes will be conducted on warm days, without wind or rain, one day north and south of Tsiigehtchic on the Mackenzie River and one day south on the Arctic Red River. Bank swallows would be documented by GPS locations, photos of colonies (to count nest holes), habitat characteristics of colony sites and approximate number of adults. If possible, the whole survey will be conducted from the boat. However, photos of colonies may be taken from shore if necessary in a manner that is safe and non-disruptive to the birds. Incidental observations of other birds of concern will be noted.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

COMMUNITY INVOVLEMENT:

Council members, local youth, as well as elders (if available) will have the opportunity to participate in the surveys. Boat navigator and boat rental will also be hired from within the Tsiigehtchic community.

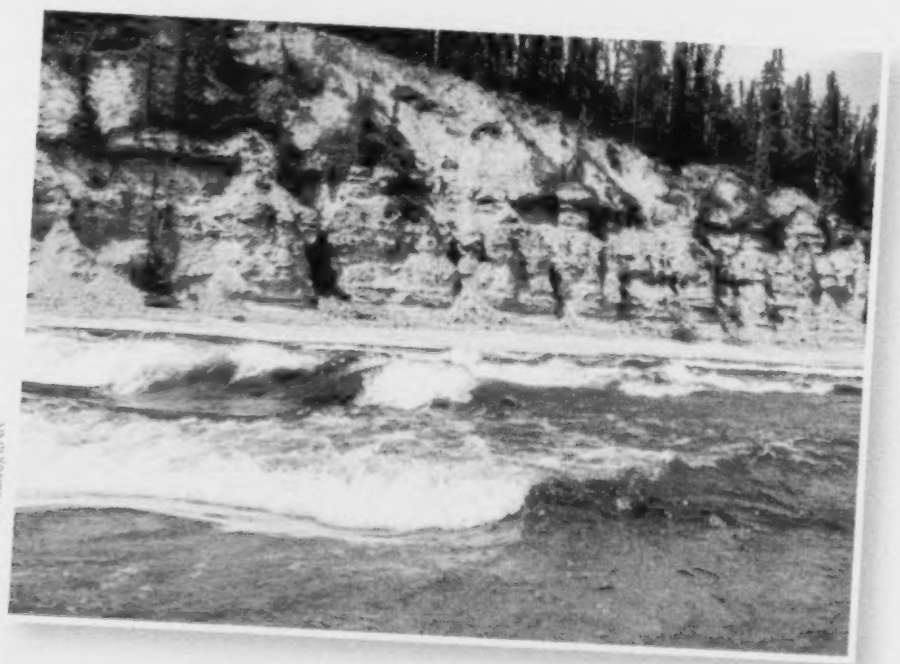

Photo: GNWT-M. Sawyer, ENR

Surveying the shoreline for swallow nests.

Bioelectronic Monitoring of Peregrine Falcons along the Mackenzie River, NWT

16 July 2014 – 29 August 2014

MAIN INVESTIGATOR:
Keith Hodson, Research Biologist

WILDLIFE RESEARCH PERMIT NUMBER:
WL500264

LOCATION:
Wrigley, Tulít'a, Norman Wells, Fort Good Hope, and Tsiigehtchic, NWT.

CONTACT:
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RATIONALE:
A species number can change in very short time if it is affected by changes in its environment. Only regular, systematic surveys can detect population changes in time to react with responses directed at preventing catastrophic decline or extinction (Kerr 2010). Peregrines and pesticides are a classic example. Historical banding has resulted in little knowledge gained because of few returns (one return in perhaps 500 bandings) but using "chip" bands we can expect numerous returns from an individual bird. Monitoring conditions affecting falcons can be equated with monitoring conditions affecting humans since both are top predators living in the same environment.

OBJECTIVES:
- To determine population status on a yearly survey, second year of study.
- To "chip" band falcons at nesting sites.
- To determine age and location of banded birds when they reach breeding age.
- To determine duration of breeding lifespan.
- To determine nest site reuse.
- To determine prey utilized by peregrines.

METHODS:

The river will be surveyed for nesting peregrines using a 20' aluminum river boat with 115 HP outboard. All known sites and all favorable looking sites will be visited to determine occupancy. Standard United States Fish and Wildlife Service bands and bioelectronic "chip" bands (Brown and McGrady 2010) will be put on birds having reached sufficient size and age to not have them fall off (approximately three weeks and older). It is anticipated a chip data logger will be set up near a nesting site in two years to determine if any, and which, banded peregrine is using that site. Prey remains samples will be collected at nest sites.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Climate Change Impacts on Habitats, Breeding Densities and Population Trends of Tundra Birds at Daring Lake, Southern Arctic Ecoregion, NWT, 1998-2014

1 June 2014 – 30 September 2014

MAIN INVESTIGATOR:

Joachim Obst

WILDLIFE RESEARCH PERMIT NUMBER:

WL500248

LOCATION:

Tundra Ecosystem Research Station (TERS), Daring Lake, NWT; from 28 June – 7 August, 2014.

PARTNERS:

The study was partially sponsored by the GNWT Department of Environment and Natural Resources (ENR). The National Wildlife Research Centre, Ottawa, ON, provided preliminary results of the mercury analysis in fish. The field work was conducted on own time by the project leader.

CONTACT:

Joachim Obst
(E) obst100@gmail.com

RATIONALE:

Birds are indicator species of environmental changes. Currently, 31 percent of 81 bird species at TERS are already on the Red List, including traditional game birds. Annual monitoring of tundra bird populations is necessary to identify and separate natural population cycles from actual population declines or increases.

OBJECTIVES:

- To monitor the impacts of climate change on habitats and population trends of tundra birds.
- To provide the data for monitoring the state of the environment, education and species conservation.

METHODS:

The numbers of birds and their locations were recorded during surveys on foot and from boat. Beached feathers, shells from hatched eggs and six gull eggs were collected with a federal permit for mercury analysis. Samples of fish were donated by fishermen onsite for mercury analysis.

RESULTS AND MAIN CONCLUSIONS:

The TERS bird list now contains 81 species including 49 breeding species. Twenty-five (31%) of these 81 species officially are ranked either as Sensitive, Special Concern, Threatened or At Risk (NWT Species at Risk and COSEWIC 2014). In 2014, the populations of songbirds were stable except for increasing numbers of warblers due to the increasing growth of shrubs. The population cycle of redpolls reached an all-time low due to the poor dwarf birch seed crop in the past year. The seed production was good in 2014 and a peak population of redpolls is predicted for 2015. Most shorebird populations were stable except two species were absent because of dry wetlands. The populations of two loon species declined but remained stable for a third loon species. The numbers of nesting ducks were the lowest on record, which is an ongoing downward trend. The occupancy of raptor sites was normal but reproduction was low. The numbers of small mammals and ptarmigan were lower in 2014 than in the past year. The observations of all other birds were consistent with results from previous years.

Preliminary results of the mercury study on water birds and fish indicate precaution is necessary regarding the consumption of lake trout larger than 55 cm at Daring Lake.

The main conclusion is climate change has positive and negative impacts on breeding birds. This will cause population declines for some species while increasing the numbers and spreading of others.

A more detailed report on the 2014 results, with the same title as this project, was submitted to ENR, Wildlife Division. The report, as well as previous reports, is available from the project leader or ENR.

LONG-TERM PLANS AND RECOMMENDATIONS:

This ongoing long term study should be continued to assist regional and national efforts for the conservation of birds and wildlife habitats. The mercury study will benefit the health of people.

Photo: Joachim Obst

Semipalmated plover on nest at Daring Lake.

Long-term Population Monitoring of Songbirds at Fort Liard, NWT

June 2014

MAIN INVESTIGATOR:

Samuel Haché, PhD, Senior Landbird Biologist,
Canadian Wildlife Service, Environment Canada

WILDLIFE RESEARCH PERMIT NUMBER:

WL500203

LOCATION:

Fort Liard area.

PARTNERS:

Financial and logistical support was provided by Environment Canada and GNWT (Fort Liard office).

CONTACT:

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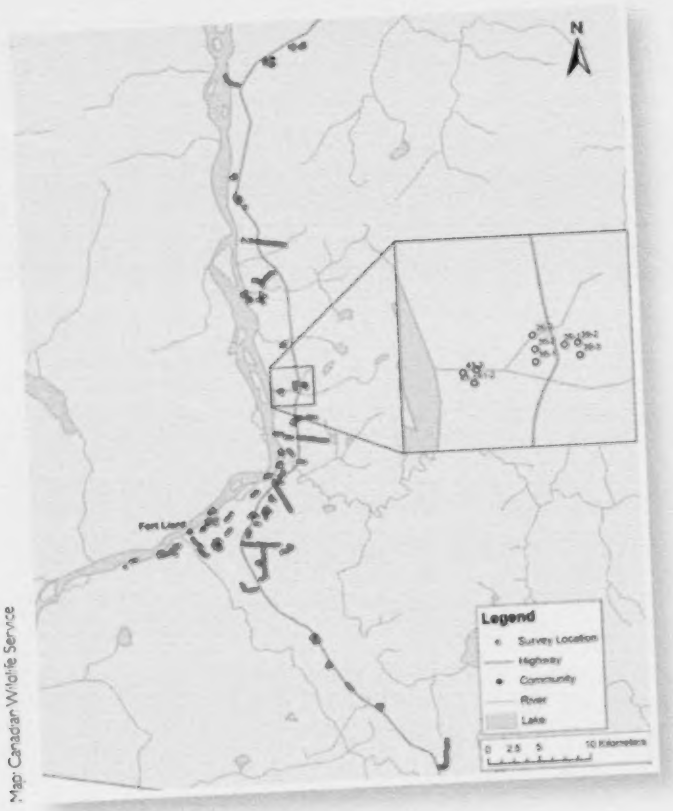
RATIONALE:

A crew from Canadian Wildlife Service (CWS) returned to Fort Liard in June 2014 to count songbirds as part of a long-term study started in 1998. Surveys are currently repeated once every three years (2017 is the next anticipated visit). The purpose of this study is to document long-term trends in songbird numbers and species composition in the region.



Map of Fort Liard study area and survey locations.

OBJECTIVES:

The objective of this project is to count songbirds repeatedly over time to detect any long-term changes to their numbers in the Fort Liard area.

METHODS:

A total of 510 counts are conducted at 255 unique locations. Each location is visited twice during June. Songbird counts are ten minutes long and conducted between sunrise and 9 a.m. Sampling locations are permanently marked.

RESULTS AND MAIN CONCLUSIONS:

We counted 6,982 birds from 76 species. Our complete dataset now contains over 56,000 records from the area. One new species for the region, a Cooper's hawk, was heard this summer. We have recorded 127 species during the 17 years of this monitoring program (including incidental observations). Although the data have not been analyzed completely, preliminary results from 2014 are similar to the trends in population abundance reported in 2011.

Recently, the results from the first 14 years of the project were published in a scientific journal. Employees from Environment Canada (EC) compared bird population trends from the Fort Liard area to those estimated for Alberta and across southern Canada. Trends for Fort Liard bird populations showed an increase in population size for more species than in the other regions. It is hypothesized that the surveys monitoring bird populations in areas with more human disturbances (i.e., Alberta and southern Canada) may not represent trends for species breeding in northern boreal regions.

The Fort Liard monitoring program provides important data for wildlife managers and is one of only a few long-term studies across Canada to monitoring boreal breeding birds in undisturbed habitat.

Machtans, C. S., K. J. Kardynal, and P.A. Smith. 2014. How well do Regional or National Breeding Bird Survey Data Predict Songbird Population Trends at an Intact Boreal Site? Avian Conservation and Ecology 9(1): 5.

LONG-TERM PLANS AND RECOMMENDATIONS:

Results from the project are used by CWS to understand bird population health in Canada. The long-term plan for the project is to continue to revisit the sites once every three years.

Photo: Canadian Wildlife Service

Canada warbler

COMMUNITY INVOLVEMENT:

We received support from the community to continue conducting our monitoring program. We used local businesses for accommodations, fuel and groceries. In previous years, we hired community members to help with the program but we were unable to do so this year.

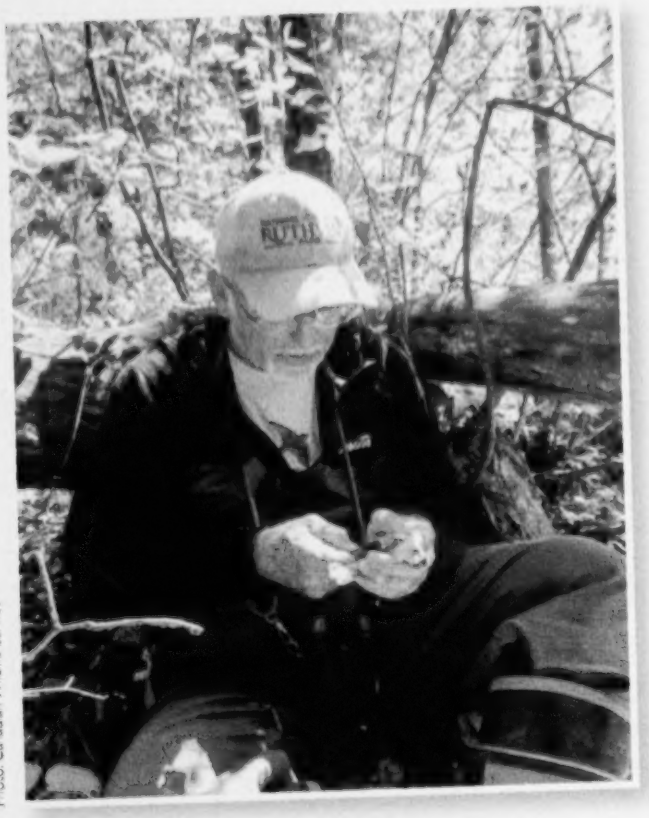


Photo: Canadian Wildlife Service

Measuring the wing of a Canada warbler.

Photo: Canadian Wildlife Service

Caribou Population Study in the Sahtú Region

1 January 2014 – 31 December 2014

MAIN INVESTIGATOR:

Jean Polfus, University of Manitoba, Winnipeg, MB

WILDLIFE RESEARCH PERMIT NUMBER:

WL500227

LOCATION:

The study took place in the Sahtú Region. Research began in January 2013.

PARTNERS:

- Ɂehdzo Got'ı̨nę Gots'ę́ Nákedı (Sahtú Renewable Resource Board)
- Ɂehdzo Got'ı̨nę (Renewable Resource Councils – RRCs) in Norman Wells, Fort Good Hope, Tulít'a, and Dél̨ınę
- Environment and Natural Resources
- University of Manitoba
- Trent University
- University of Calgary

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RATIONALE:

The main goal of this research project is to develop a comprehensive understanding of the identities and relationships among caribou populations and Dene people in the Sahtú region of the NWT in order to inform and prioritize management efforts. The project brings together traditional knowledge (TK) and non-invasive population genetics to organize and understand the biological diversity of caribou. The research includes collecting caribou fecal pellet samples. Genetic analysis of the mucosal layer covering the fecal pellets will help define spatial genetic patterns and characterize the boundaries of different groups of caribou.

OBJECTIVES:

The project will bring together multiple approaches to describe and understand the biological diversity of caribou. The research objective is to create an assemblage of knowledge by exploring Aboriginal and western science descriptions of species variation, population structure, and spatial dynamics.

- **Caribou Diversity:** Within the study region caribou belong to three different designatable units: barren-ground, boreal, and mountain.
- **Spatial Organization of Caribou:** Phylogenetic and population genetic analyses will help delineate and characterize the main population units.
- **TK:** This study will shed light on how people identify different groups and types of caribou.

METHODS:

This project uses an interdisciplinary socio-ecological approach that will allow for the development of questions and concepts based on the goals, values, and priorities of communities.

TK: TK will be shared during informal trips on the land, expert workshops, and focus group meetings. The focus groups will help to build a comprehensive understanding of the origin, dynamic interactions, and spatial structure of caribou.

Population genetics: Caribou pellets will be collected non-invasively by community members, researchers from other projects, and industry monitors. We will use multiple markers (microsatellites, mtDNA) and multiple analytical approaches to help characterize population structure.

RESULTS AND MAIN CONCLUSIONS:

Over 900 caribou fecal pellets and tissue samples were collected in collaboration with local community members during the winters of 2013 and 2014. Preliminary results of genetic structure analysis of ten microsatellite markers indicate that tǫdzı (boreal woodland caribou) can be differentiated from other types. This is especially interesting because the mitochondrial DNA analysis revealed a lack of clear phylogenetic signature between the groups. Dene knowledge also indicates that tǫdzı are a unique group in the Sahtú region. These results point to the importance of assessing multiple criteria when determining population boundaries.

LONG-TERM PLANS AND RECOMMENDATIONS:

The importance of population designations and classification systems to conservation biology cannot be overstated. If management boundaries do not reflect the true spatial distribution of caribou, recovery strategies will be ineffective. We hope to produce important contributions to the understanding of caribou genetic biodiversity and also publish on collaborative research methodologies and intersections between harvester knowledge and genetic results through the final PhD dissertation. Community meetings to present and interpret results will provide an avenue for exchange of ideas and promote knowledge generation.

COMMUNITY INVOLVEMENT:

In December 2012, we met with the Sahtú RRCs to develop research priorities, research questions, and choose appropriate methods for current and future caribou monitoring. In January 2013, a series of RRC and public meetings were held to set up a solid plan for winter sampling, build awareness for the program, and train community members in sampling techniques. The RRCs oversee sample collection, data entry, and supervise gift card distribution. Community members received a gift card for gas for their participation when they submitted samples.

During the winter of 2013 we traveled within the communities in the Sahtú to collect samples, participate in harvesting activities, meet with students at local schools and Aurora Colleges, and coordinate the sampling efforts. In April 2013, we held meetings with the RRCs to discuss how the project could be improved and work with harvesters to understand the current state of caribou populations in the region. In September 2013, we participated in the Tulít'a community fall hunt where we collected caribou genetic and health monitoring samples, worked with youth, and shared information and results with harvesters.

During the winter of 2014 community based sample collection was continued in collaboration with ENR. We also traveled to Drum Lake in the Mackenzie Mountains to visit and present to an Environmental Monitoring course. In early April we spent three days flying by helicopter with local RRC representatives to locate recent caribou activity (tracks and cratering sites) and collect samples. In May 2014 we swabbed the caribou scat samples for genetic analysis in Norman Wells. High school science students from the Mackenzie Mountain School in Norman Wells attended a presentation on the project and were able to assist with lab work at the ENR Wildlife office. In June 2014 we held a focus group session in Tulít'a with key individuals who have contributed knowledge about caribou to this project to ensure that information and knowledge that has been shared about caribou in previous meetings accurately reflected Dene knowledge about caribou.

Occupancy Survey and Genetics Study of Northern Mountain Caribou in the Proposed Prairie Creek Road Area

February 2014 – March 2014

MAIN INVESTIGATOR:

Douglas Tate, Ecologist Team Leader,
Nahanni National Park Reserve

WILDLIFE RESEARCH PERMIT NUMBER:

WL500211

LOCATION:

Vicinity of the proposed Prairie Creek access road (Dehcho Region; NTS Map Sheets 95-F and 95-G) from Prairie Creek mine to Liard Highway near Nahanni Butte. Areas inside and outside the boundary of Nahanni National Park Reserve (NNPR) were included.

PARTNERS:

The NahPa Dehé (ND) and Liidlii Kue First Nations (LKFN; Nahanni Butte and Fort Simpson) as well as the Dehcho First Nations office were consulted in the development of this project, both directly and through the NahPa Dehé Consensus Team (cooperative management team for NNPR). Golder Associates Ltd. were contracted to lead the aerial survey flights and occupancy analyses. University of Manitoba staff and students (Micheline Manseau and Jean Polfus) are leading interpretation of genetic information and sequencing is being carried out at Trent University.

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RATIONALE:

The construction, operation and maintenance of a mine access road could potentially impact caribou populations in the vicinity. This work was undertaken to document the distribution (occupancy) and genetic composition of caribou in the vicinity of the proposed Prairie Creek access road, in order to compare with previous survey work and provide baseline data for future monitoring.

OBJECTIVES:

- To determine current caribou occupancy in the vicinity of the proposed Prairie Creek access road.
- To compare the results with previous survey work in the area.
- To use DNA analysis to determine genetic composition of caribou in the Prairie Creek area, in relation to other regional mountain caribou herds and boreal caribou populations.

METHODS:

Aerial surveys in a Cessna fixed-wing aircraft were used to document the distribution of caribou in the vicinity of the proposed Prairie Creek access road. The study area was divided into 100 km^2 survey blocks, and all blocks were flown during each of three survey events in February and March 2014. Observers recorded sightings of caribou as well as tracks to document caribou presence. Data was analyzed using occupancy modelling approach.

Caribou scat (pellet samples) were collected using helicopter access following each survey event, focusing on areas where caribou or sign had been observed. Samples were sent for genetic analyses to other researchers involved in a larger study of caribou DNA in NWT and other regions of Canada.

RESULTS AND MAIN CONCLUSIONS:

Preliminary results of the aerial survey work suggest caribou continue to occur in the vicinity of the Prairie Creek mine and access road. Occupancy (number of survey blocks in which caribou were detected) may have declined since 2010-2011 survey work, but this could also be related to seasonal variation: Surveys in 2014 were later in winter than the 2010-2011 work so caribou ranges may have naturally contracted as winter progressed rather than actually declined over the years.

Genetic analysis of the 2014 pellet collections has not yet occurred. Initial processing of samples is underway and results can be provided when available.

LONG-TERM PLANS AND RECOMMENDATIONS:

Results of the aerial survey and occupancy modelling are still under review and decisions on long term plans are pending. Similar surveys may be undertaken in a few years to determine if trends are occurring. Information may be of value in determining appropriate mitigations for caribou and other wildlife in relation to road construction and operation in the area.

Genetic data will be analyzed in relation to other data from NWT and other parts of Canada. It is hoped a clearer picture of the genetic affiliations of caribou in the Prairie Creek area can be determined, which may have a bearing on management decisions both inside and outside of the national park.

COMMUNITY INVOVLEMENT:

No major concerns were identified during consultation on the project. One LKFN member participated in some of the surveys but due to scheduling and aircraft capacity it did not work out to have anyone from ND Dene Band directly involved. Input from the consensus team's Dehcho members was used to help plan survey routes and pellet collection sites. Final reports will be distributed to communities.

Mountain Caribou Pellet Survey

September 2014

MAIN INVESTIGATOR:

Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500260

LOCATION:

Prairie Creek mine access road, Mackenzie Mountains to Liard Highway near Nahanni Butte. Fieldwork was completed between September 16-21, 2014.

PARTNERS:

- CZN
- Parks Canada

CONTACT:

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RATIONALE:

CZN is proposing to upgrade the winter road to an all-season road (the road). Previous wildlife surveys conducted as part of the Prairie Creek mine permitting process indicate woodland caribou *(Rangifer tarandus caribou)* inhabit the lands surrounding the mine and winter road alignment. However, little information existed on the extent of caribou distribution and area of occupancy along the proposed road alignment, particularly during the non-winter period. In July 2014, CZN contracted Golder Associates Ltd. (Golder) to conduct a study to determine caribou distribution along the proposed road during the non-winter period.

OBJECTIVES:

The specific objective of this study was to determine the presence of caribou along the proposed road in summer and to use this data to estimate the probability of future caribou occurrence.

METHODS:

Sample sites were selected according to a stratified random design, using the caribou summer habitat suitability index (HSI) of Polfus et al. (2013) to stratify the study area into three categories of suitability. A caribou sign survey was conducted along transects on foot by teams of two surveyors. Incidental wildlife sign encountered along transects was also recorded.

Occupancy models were used to analyze the data. Occupancy models allow variables affecting both presence of animals (i.e., occupancy) and the ability to detect animals when they are present (i.e., detection) to be modelled simultaneously. Covariates of both occupancy and detection were modelled using the logit link function. An *a priori* model set was defined to represent the decreasing hierarchy of site information from sampling design strata, to calculated HSI scores, to covariates used to build the HSI models. Akaike's Information Criterion (AIC) was used to assess the best fit among these models. To estimate the probability of caribou occupancy along the entire length of the road, the final model equation was calculated for all blocks in the study area. A total of 139 transects were sampled in 35 blocks across the study area.

RESULTS AND MAIN CONCLUSIONS:

Caribou occupancy was predicted in sampling blocks with higher area of krummholz/alpine shrub land cover and higher area with an aspect between southeast and northwest in a clockwise direction. Detection was higher for sampling conducted on the road bed. Based on model predictions, it may be expected areas with the highest likelihood of caribou-vehicle conflict during the non-winter period are the Silent Hills, west of the Ram Plateau, the lower Sundog Creek drainage and the Mackenzie Mountains near the mine site. There is uncertainty associated with any model and it is important to consider this during interpretation. The proposed road follows a steeply incised valley through the Mackenzie Mountains, such that caribou would have to move over steep terrain to travel north-south through this area. While this is likely, it is also likely they would move along the valley bottom, suggesting some caribou presence may be expected throughout that area. Similarly, sample blocks are only 1.5 km wide, and thus, caribou may also be expected to be present in the region around blocks with higher predicted occupancy, to some extent.

LONG-TERM PLANS AND RECOMMENDATIONS:

None at this stage. Dependent on outcome of EA1415-01.

COMMUNITY INVOLVEMENT:

No community members were involved due to the technical nature of the work and requirement of having Level 1 Occupational First Aid.

Dehcho Boreal Caribou Collar Deployment

1 April 2013 – 31 March 2014

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005039

LOCATION:

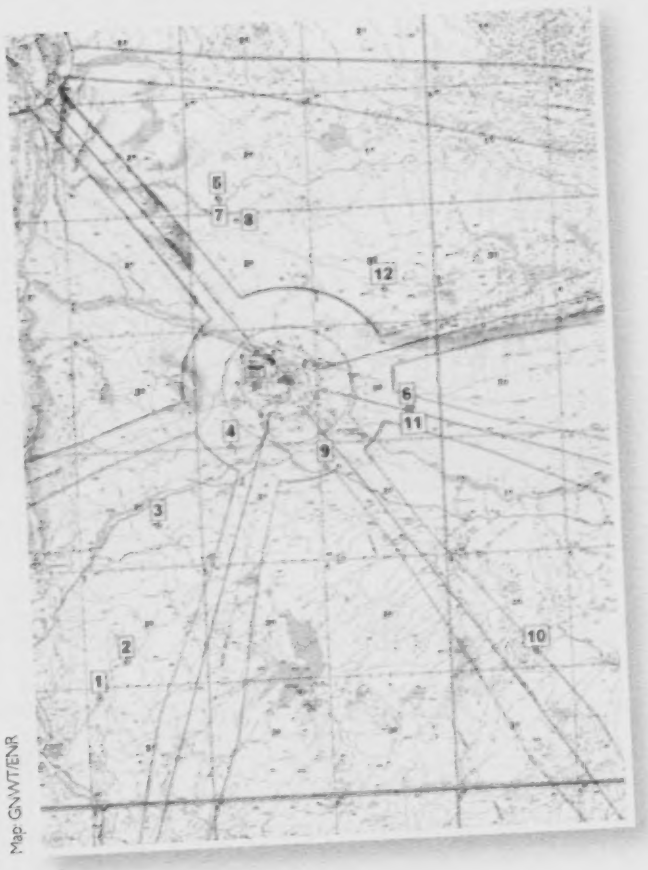
This is an ongoing study, initiated in March 2004. It has increased in size and scope to include the traditional areas of eight Dehcho First Nations and includes that area of the Dehcho region east of the Mackenzie Mountains. The study area is adjacent to the Hay River lowlands study areas where female boreal caribou have been collared by the South Slave Environment and Natural Resources (ENR) staff as part of another study. The 12 collars deployed under this permit were deployed within the study area outlined on the map. All the collars deployed were ARGOS GPS units (Telonics), most with the capability of providing location data for up to five calving periods. Four of the units will provide ambient temperature with each satellite location.

PARTNERS:

- Funding assistance provided by: Environment Canada; and the Cumulative Impacts Monitoring Program.
- First Nation partners include Sambaa K'e Dene Band, Liidlii Kue First Nation, Fort Simpson Métis Local, Jean Marie River First Nation, Pehdzeh Ki First Nation, Nahanni Butte Dene Band, Acho Dene Koe Band and Ka'a'gee Tu First Nation.

RATIONALE:

To ensure informed land use decisions are made in regard to the maintenance of boreal caribou populations in the Dehcho, radio collars were deployed on female boreal caribou starting in March 2004.



Map GNWT/ENR

Locations where collars were deployed on female boreal caribou in February 2014.

A combination of satellite, GPS and VHF collars have been deployed on female boreal caribou to document annual vital rates of the Dehcho local population, seasonal range use, seasonal movements, detailed daily movements and fidelity to calving areas of female caribou over multiple years in areas of boreal caribou range that have had limited to moderate fire and seismic disturbances. VHF collars were deployed only once in 2006 and the use of satellite collars has been phased out during the course of the study. GPS units providing three locations per day, and with a lifespan of five calving periods, are the standard units we are deploying. Collars and the annual spring classification surveys provide estimates of calf and adult female survival as well as calf production, which provide annual estimates of the rate of population change. More specific details are available in the annual *Dehcho Boreal Caribou Progress Report, April 2013*.

OBJECTIVES:

- To monitor annual calf production, calf survival, and adult survival in order to make annual estimates of λ.
- To ensure that the distribution of collared boreal caribou covers key areas throughout the range of boreal caribou in the Dehcho region.
- To determine the calving period and the degree of fidelity of female caribou to calving areas over multiple years in areas with a range of seismic and fire disturbance history.
- To use location data of female boreal caribou over multiple years overlaid with the current human footprint and wildfires to determine areas of high use and areas of avoidance by female boreal caribou in the landscape, and whether there is a seasonal component.
- To provide empirical data to determine areas of secure boreal caribou habitat, given the current human footprint, and to compare this to the predictions and robustness of the study completed to predict high value boreal caribou habitats in the Dehcho.
- To provide empirical data for assisting in the development of range plans as part of the National Recovery Strategy.
- To provide empirical data for RSF modeling to assist with assessing important habitat types/areas.
- To provide current knowledge of boreal caribou ecology to the Dehcho Boreal Caribou Working Group and for use with evaluating land use applications made in the Dehcho.
- As development occurs to be able to assess responses of female caribou in relation to their use of space in the landscape.
- To continue to document cause of death of collared animals as the opportunities arise.
- To continue to document and assess disease and parasites in boreal caribou.

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METHODS:

Adult female caribou were live captured by a professional net-gunning team using techniques approved by the ENR Wildlife Care Committee and used in previous collar deployments. The net is fired by a gunner in the helicopter and captures the caribou.

Blood, hair and fecal samples, a neck girth measurement and photos of the teeth were collected from each female caribou as long as the opportunity was provided.

A more detailed methodology and description of the collars and their duty cycles can be found in the *Dehcho Boreal Caribou Progress Report, April 2009.*

RESULTS AND MAIN CONCLUSIONS:

GPS collars were deployed successfully on 12 female boreal caribou throughout the Dehcho Region; six on females north of the Mackenzie River and six on females south of the Mackenzie River. The collars are programmed to release in either June 2017 or June 2018. Based upon serum progesterone all 12 females were pregnant.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring of collared caribou will continue through the life of the collars currently deployed to better refine local and landscape seasonal patterns of use over extended periods of time. Annual reports of the program have been prepared. Additional collars, including more iridium units, are to be deployed in February 2015 to ensure there are at least 30 functioning collars on female boreal caribou annually.

COMMUNITY INVOLVEMENT:

The eight local First Nation partners provided information on where they would like caribou collared and indicated animals currently collared should be used for locating other caribou to capture for collar deployment to reduce the amount of air traffic. Each First Nation partner was provided with a minimum of one collar to deploy in their traditional area as requested.

Photo: GNWT/N. Larter, ENR

Boreal caribou

Boreal Caribou Trends and Habitat Use in the Hay River Lowlands

11 February 2013 – 11 February 2014

MAIN INVESTIGATOR:

Allicia Kelly, Manager Wildlife Research and Monitoring and Karl Cox, Wildlife Technician,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500106

LOCATION:

The Hay River lowlands study area is bounded by Hay River to the east, the Mackenzie River and Great Slave Lake to the north, the Redknife River to the west and the Cameron Hills to the South.

PARTNERS:

This program has been supported by the following groups:

- Deh Gáh Got'ie First Nation
- Fort Providence Métis Nation
- Hay River Métis Council
- Ka'a'gee Tu First Nation
- K'átł'odeeche First nation

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RATIONALE:

Boreal caribou monitoring is required to determine if these ranges are providing sustainable habitat for boreal caribou, to understand how boreal caribou respond to development, climate change and other pressures and to make effective management decisions to conserve boreal caribou for future generations. This study has been ongoing since 2003 and has provided valuable information on boreal caribou population demographics, condition and habitat selection in South Slave region. Monitoring was very limited in 2012 due to very few collared cows in this area and postponed funding.

OBJECTIVES:

- To monitor population demographics: adult female survival, calf production, ten-month calf recruitment, and finite rate of population increase.
- To document seasonal range use, annual home ranges and fidelity to calving areas.
- To examine boreal caribou habitat use and selection in relation to natural and human caused disturbance and landscape features.

Photo: Diversified Environmental

Boreal caribou

METHODS:

GPS collars were deployed on 27 adult cows to monitor the movements, habitat use, and survival of these caribou.

A fixed wing aircraft was used to fly the area before collaring to identify areas where the collaring crew would be likely to find caribou. Knowledge of historical and recent range use and reports from land users were also used to help determine where caribou were located prior to collaring. Locations and group size of observed caribou, and caribou tracks, were recorded and mapped.

Caribou were live captured using a net gun fired from a helicopter by an experienced capture crew.

Ten-month calf recruitment was determined from aerial surveys in February or early March by counting and classifying the number of calves and adults associated with collared caribou and other caribou observed during the survey. For each year, the finite rate of population increase will be estimated from annual recruitment of females (assuming a 50:50 sex ratio in calf production and equal survival of sexes to time of census) and annual adult female mortality using the formula outlined by Hatter and Bergerud (1991).

In cooperation with harvesters, DNA samples and a basic set of samples for disease, parasite and contaminant analysis will be collected. These samples will be banked for broader-scale or future analyses. Environment and Natural Resources staff may also collect biological specimens (e.g. fecal pellets) opportunistically or where feasible during other surveys.

RESULTS AND MAIN CONCLUSIONS:

Analysis and results are pending and a report is in progress.

LONG-TERM PLANS AND RECOMMENDATIONS:

Future monitoring will focus on boreal caribou habitat north of the Cameron Hills. We recommend monitoring of boreal caribou continue with a minimum of 25 collared cows in the study area. Caribou movement and location data also provides valuable data on how caribou use the habitat available to them.

COMMUNITY INVOLVEMENT:

Local observers are used when possible for surveys. Results are shared and discussed at community-based meetings including the biennial regional wildlife workshops.

Photo: Diversified Environmental

Collaring boreal caribou

CLS America Data Acquisition (Barren-ground Caribou and Polar Bears)

April 2014 – March 2015

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management, Environment and Natural Resources, Inuvik Region

2013-2014 WESTERN NWT BIOPHYSICAL STUDY

LOCATION:

Gwich'in Settlement Area and Inuvialuit Settlement Region.

PARTNERS:

- Environment and Natural Resources (ENR)
- Gwich'in Renewable Resources Board
- Inuvialuit Game Council
- Wildlife Management Advisory Council (NWT)

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RATIONALE:

This study was established to help ensure baseline data necessary to assess, mitigate and monitor the environmental impacts of proposed developments in the western NWT is available to industry, regulators, communities and government.

OBJECTIVES:

- To collect baseline data for polar bear and barren-ground caribou.

METHODS:

Collars were deployed on the species as set by the ENR NWT Wildlife Care Committee (WCC) applications. Collars were GPS collars.

RESULTS AND MAIN CONCLUSIONS:

Movements were monitored and archived in the Wildlife Management Information System (WMIS) from collared barren-ground caribou and polar bears.

LONG-TERM PLANS AND RECOMMENDATIONS:

ENR plans to continue to monitor barren-ground caribou movements. Additional caribou collars will be deployed in March 2015 for a photo survey in July 2015.

COMMUNITY INVOLVEMENT:

Assistants are hired from local communities. Results presented to Gwich'in Renewable Resources Board, Renewable Resources Councils, Wildlife Management Advisory Council (NWT), Inuvialuit Game Council and Hunters and Trappers Committees.

Photo: GNWT/D. Allaire, ENR

Collaring of Barren-ground Caribou at Water Crossings

September 2014 – October 2014

MAIN INVESTIGATOR:

Tracy Davison, Regional Biologist,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500274

LOCATION:

Nallok, NWT.

PARTNERS:

- IFA – Wildlife Studies Fund
- Environment and Natural Resources

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RATIONALE:

Population estimates obtained for the Cape Bathurst caribou indicate the herd declined between 2000 and 2005 with continued declines in 2006. Due to these declines, management actions recommended by the co-management boards are being implemented. However, the 2009 survey showed the populations had stabilized. 2012 survey results indicate Cape Bathurst herd has increased from 1,934 to 2,427.

Collars are necessary for the post calving photo survey technique to estimate the population size.

Current plans are to repeat the survey in 2015. Due to concerns raised about net gunning caribou in the spring when cows are pregnant, ENR committed to trying alternative collaring techniques.

ENR would like to deploy GPS collars on adult female and male caribou at water crossings to determine the feasibility for future population surveys. This will allow monitoring of the movements of the collared caribou to look at winter distribution to ensure the collars adequately spread out from the central collaring location so they reflect herd distribution.

OBJECTIVES:

- To collar caribou at water crossings to determine feasibility for the future.
- Monitoring of caribou movement and range use by GPS collars.

METHODS:

Fifteen caribou (10 cows and five bulls) will be equipped with GPS collars. Timing will be chosen based on local knowledge. A capture crew will consist of the boat operator and two handlers. The crew will drive up to the caribou as it is swimming. One handler will secure the caribou while the other handler samples and attaches the collar.

Collars on male caribou will be fitted loosely to allow for increases in neck size during the rut.

Each caribou will be examined to assess condition (fat cover over back). The radio collars will be fastened around the caribou's neck. Hair samples will be taken for DNA. Incisors may be photographed to assist in estimation of age from the amount of wear visible and eyes checked for besnoitiosis.

Caribou will be monitored post-capture by the GPS location data. If the collar becomes stationary, efforts will be made to locate the caribou as soon as possible in order to identify the cause of any mortality. All collars will have a programmable breakaway device that allows the collar to drop to the ground approximately three to five years after deployment. Thus, the caribou do not need to be handled again to remove the collars.

RESULTS AND MAIN CONCLUSIONS:

Between September 8 and 16, a pilot project was conducted to determine if caribou could be collared as the animals cross the water at Nallok. Two boats, with two crew members in each boat, were used. Ten bull caribou were observed by the crew between September 9 and 11. Only one caribou was observed crossing the water. The caribou observed in the water was a prime bull and the crew was unable to put a collar on it because its neck was too large. No collars were deployed.

LONG-TERM PLANS AND RECOMMENDATIONS:

Although ENR was unable to deploy any collars this year, it was determined this method could be successful at Nallok with refinements to determine timing. Collared caribou (11 cows and one bull) were still on the summer range between Anderson and Horton Rivers in September.

CLS America Data Acquisition (Bluenose-East Caribou)

April 2014 – March 2015

MAIN INVESTIGATOR:

Heather Sayine-Crawford,
Manager Wildlife Research and Monitoring,
Environment and Natural Resources, Sahtú Region

2013-2014 WESTERN NWT BIOPHYSICAL STUDY

LOCATION:

Bluenose-East barren-ground caribou herd range.

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RATIONALE:

Geo-referenced data on collared Bluenose-East barren-ground caribou are used to monitor the herd's movements, identify seasonal and annual ranges and to help produce accurate and precise population estimates and other measures of population performance (e.g. recruitment and adult sex ratio). Location data is also important for land use planning, protected areas planning and environmental assessment and monitoring.

OBJECTIVES:

- To identify, map and verify barren-ground caribou annual and seasonal ranges.

METHODS:

Barren-ground caribou are captured and collared as set out in the ENR NWT Wildlife Care Committee applications. Data received from CLS America is used by the Sahtú GIS Project (ENR Norman Wells) to create digital maps of the movements of the Bluenose-East barren-ground caribou herd.

RESULTS AND MAIN CONCLUSIONS:

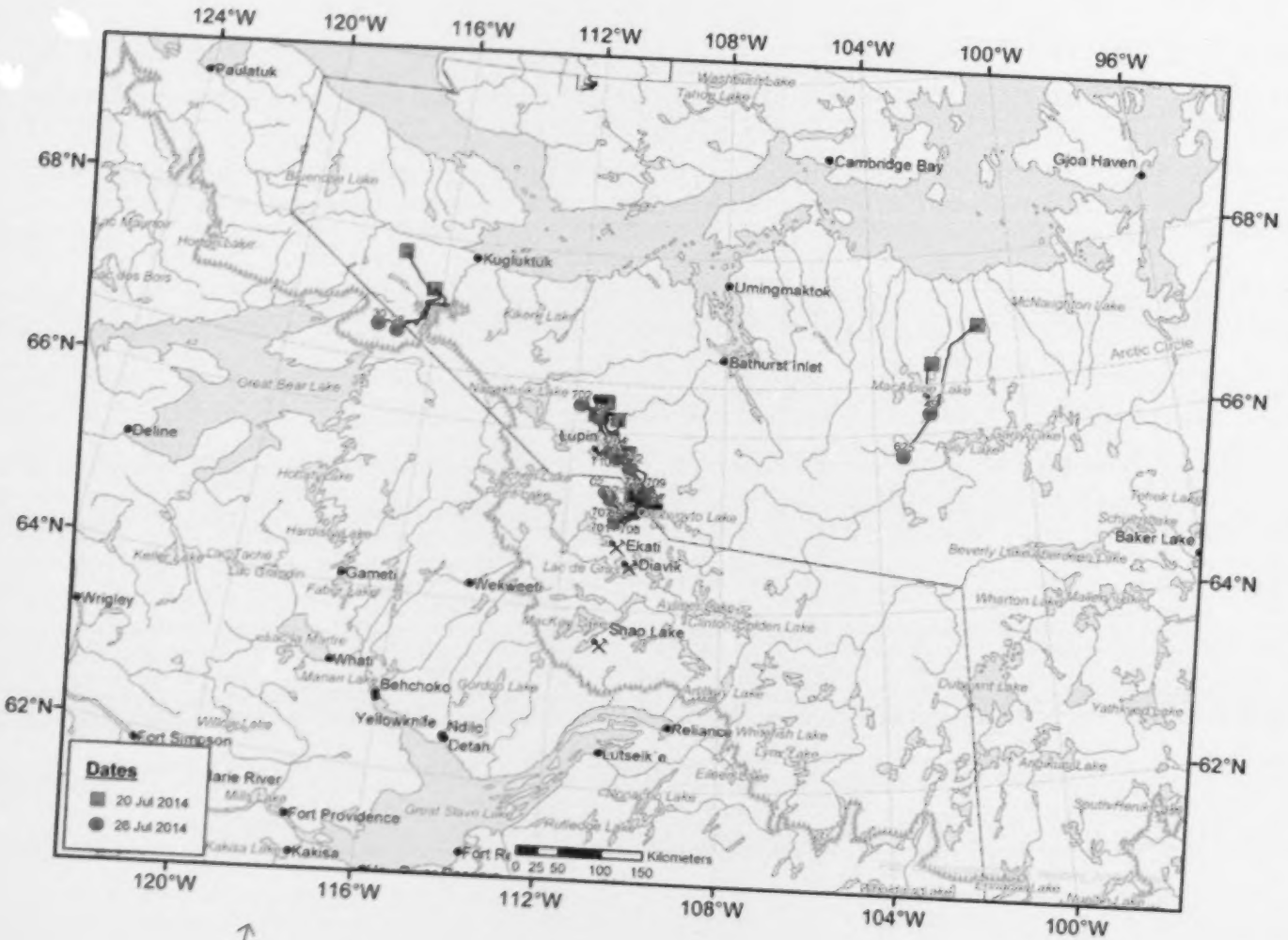
Collar location data are processed and stored in the database of the Sahtú GIS Project (ENR Norman Wells). Location data are also stored in the GNWT Wildlife Management Information System.

LONG-TERM PLANS AND RECOMMENDATIONS:

Deployment of new collars is scheduled for March 2015.

COMMUNITY INVOLVEMENT:

Community assistants are hired from local communities. Results are presented to the Sahtú Renewable Resources Board and the Renewable Resources Councils.



Movements of barren-ground caribou cows collared on winter ranges of Bathurst and adjacent herds - July, 2104.

Bathurst, Bluenose-East, Beverly, and Ahiak Caribou Health, Condition and Contaminants Monitoring

March 2013 – February 2014

MAIN INVESTIGATOR:

Bruno Croft, Manager Research and Monitoring,
Environment and Natural Resources,
GNWT, North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500119

LOCATION:

Bathurst, Bluenose-East, Beverly and Ahiak caribou late winter and fall range (exact location to be determined based on current caribou locations).

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RATIONALE:

Health, body condition, disease and parasites of barren-ground caribou provide important information on the status of the herds and on the potential for population growth. Basic samples taken from animals harvested permit current levels of environmental contaminants to be determined and trends over time evaluated.

OBJECTIVES:

- To collect basic information on the health, diseases and parasites of Bathurst, Bluenose-East, Beverly, and Ahiak barren-ground caribou to assess current status and monitor trends over time.
- To collect basic information on body condition of caribou on the Bathurst, Bluenose-East, Beverly and Ahiak range during the fall and winter, which can be used to assess nutritional status and pregnancy rates.
- To collect information on the presence of environmental contaminants in caribou, and to assess current exposure and trends over time.
- To compare this information to previous information from the Bathurst, Bluenose-East, Beverly and Ahiak caribou herds and other caribou herds across the north using a standardized protocol developed by the Circum Arctic Rangifer Monitoring and Assessment Network (CARMA) and previous collections by the Department of Environment and Natural Resources (ENR).

METHODS:

Health, condition and contaminant monitoring will be done on caribou harvested by community hunters in the North Slave caribou range in late winter and in the fall of 2013. Sample kits will be distributed to caribou monitors and they will supervise collection of samples at the community level with the assistance of ENR staff.

Field sampling and laboratory testing will be done using a standardized protocol developed by CARMA and from knowledge acquired from previous collections by ENR. Samples will be collected in the field and stored in a manner consistent with future testing needs. The level of information collected will be consistent with the less detailed Level I CARMA sampling protocol.

Samples and information recorded will include: sex and age of animals harvested; location; back fat measurements; collection of kidney (left) with fat; if females are pregnant or not in the winter; collection of the lower jaw with incisor teeth for aging; and, hunter score of their overall body condition assessment in the field.

Diseases and Parasites: No specific collection of parasites is included as part of the CARMA Level I protocol but hunters and community monitors are encouraged to report and/or collect samples if major diseases or parasites are present on caribou harvested.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Monitoring of the Bathurst and Bluenose-East Caribou Herds

March 2013 – February 2014

MAIN INVESTIGATOR:

Bruno Croft, Manager Research and Monitoring,
Environment and Natural Resources, GNWT,
North Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500118

LOCATION:

Survey area is expected to extend from Déljne, south of Great Bear Lake, Keller Lake and Grandin Lake and all areas between the communities of Behchokǫ, Whatì, Gamèti, Wekweeti, Dettah and Łutselk'e.

CONTACT:

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RATIONALE:

To ensure that barren-ground caribou herds remain healthy, a number of monitoring actions must be undertaken on an annual basis to provide decision makers with relevant information to address management objectives. The following monitoring actions are considered part of the core monitoring program at all times regardless of the status of the herds.

- The use of satellite collared caribou hugely facilitates the monitoring of movement and distribution of migrating caribou on a weekly basis. For that purpose, community leaders/elders and the ENR have mutually agreed in the past to deploy, maintain and manage up to 20 collars on Bathurst barren-ground caribou cows annually.

  A non-systematic reconnaissance survey will first be conducted in mid-March to locate major concentrations of Bathurst caribou. The location of existing satellite collars prior to the survey will be used to allocate survey efforts.

  Satellite collars are needed to: 1) follow movement and distribution of caribou; 2) quantify cow mortality; and, 3) plan the design of various caribou surveys including the calving ground photographic survey.

  The location of satellite collared caribou is also used for planning community hunts when requested by Aboriginal leaders.

- The spring and fall composition surveys also provide two important indicators of caribou herd health.

  The late winter calf survival survey (spring recruitment survey) provides a measure of calf survival as they reach nine months of age and an index of recruitment for the herd. Normally, this survey is conducted late March or early April every year to provide a long-term trend assessment of productivity regardless of the status of the herds.

- The fall survey is conducted during the rut (mid-October) and is designed to assess the ratio of bulls to cows in the herd. Usually a herd in decline and/or at low numbers will have a low sex ratio.
- Knowledge of the sex ratio is also needed to extrapolate the total population estimate when a calving ground photographic survey is conducted.

OBJECTIVES:

- To continue to acquire location data from satellite collars currently deployed on up to 20 cows on the Bathurst barren-ground caribou herd.

METHODS:

Satellite collars are programmed to transmit locations throughout the year. These locations are acquired from Service Argos and mapped weekly using ArcView GIS software and distributed to user groups by fax and/or e-mail.

A systematic reconnaissance survey will be conducted to determine spatial distribution of wintering barren-ground caribou in the North Slave region as well as pattern of density. A Turbo Beaver aircraft using wheels/skis will be used for this work.

Results of the systematic reconnaissance survey will indicate where collaring efforts need to be allocated for both the Bluenose-East and Bathurst barren-ground caribou herds.

Further aerial surveys (helicopter or fixed wing flown no lower than 300 m AGL) will only be conducted if unexpected events make it necessary to investigate caribou distribution over the Bathurst and Bluenose-East caribou range.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Grizzly Bear DNA Monitoring Program Inuvik to Tuktoyaktuk Highway

June 2014 – August 2014

MAIN INVESTIGATOR:

Robin W. Baron, Wildlife Biologist,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500258

LOCATION:

The study area is between Inuvik and Tuktoyaktuk and goes from the Mackenzie Delta in the west to the Husky Lakes area in the east.

PARTNERS:

- Department of Transportation (DOT)
- Environment and Natural Resources (ENR)
- Inuvik and Tuktoyaktuk Hunters and Trappers Committees

CONTACTS:

Marsha Branigan, Manager Wildlife Management/
Robin W. Baron, Wildlife Biologist
Environment and Natural Resources
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robin_baron@gov.nt.ca

RATIONALE:

This project is part of the wildlife effects monitoring program (WEMP) for the Inuvik to Tuktoyaktuk highway.

OBJECTIVES:

To understand the impact of the Inuvik to Tuktoyaktuk highway on the grizzly bear population in the area. In particular, the grizzly bear DNA data and mortality data from harvesting and other factors will be used to:

- Estimate grizzly bear abundance and distribution during the pre-construction period; and,
- Build baseline habitat-based models of grizzly bear distribution relative to the road to be used to infer changes in bear distribution and density relative to the road once construction occurs.

METHODS:

The summer of 2014 was the second of two years of pre-construction grizzly bear DNA surveys. The study area was divided into (101) 10x10 km cells. A hair snag tripod was placed near the center of each cell and baited with a scent lure.

Hair samples were collected over four sessions spaced approximately 14 days apart starting in mid-June and running until mid-August, 2014. Two fieldworkers assisted with the work, one from Tuktoyaktuk and one from Inuvik. Each time a site was checked, hair samples were labeled with a unique number-letter combination. The hair samples were sent to a genetics laboratory for analysis.

RESULTS AND MAIN CONCLUSIONS:

Results from the 1,262 hair samples collected in 2013 have been returned. Hair from the 989 samples collected in 2014 is currently being analyzed. In 2013, 75 bears (46 females and 29 males) were detected. Of these, more were detected in the northwestern than in the southeastern portion of the study area. A majority of the bears had mean detection locations to the west of the Inuvik to Tuktoyaktuk highway alignment.

Assessment of grizzly bear movement between sites estimated grizzly bears moved an average of 10.6±1.3 km (SD; females) and 12.9±2.2 km (SD; males) between detections. However, both males and females occasionally made large-scale movements of more than 50 km across sessions. Using the hair snag study method, spatially explicit estimates suggest grizzly bears can be detected up to 20 km (females) and 25 km (males) from their home range centers. Using these estimates, nine male and 11 female grizzly bears were in the detectable range of the road alignment in the summer of 2013.

LONG-TERM PLANS AND RECOMMENDATIONS:

After the Inuvik-Tuktoyaktuk highway is completed, the hair snag monitoring program for DNA will continue for two more seasons. The data will then be analyzed for changes in distribution and abundance of grizzly bears over time.

COMMUNITY INVOLVEMENT

Members of both Hunters and Trappers Committees (HTCs) are part of the survey crew. Survey results were discussed with the HTCs and the developer to determine appropriate mitigation and monitoring as per the wildlife permit.

Grizzly Bear Denning Survey for the Inuvik to Tuktoyaktuk Highway

October 2014 – November 2014

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500277

LOCATION:

Along the proposed construction areas for 2014/2015 and the geotechnical program for Inuvik-Tuktoyaktuk highway.

CONTACT:

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RATIONALE:

Project will collect data on grizzly bear denning activity in the vicinity of the proposed road. ENR is conducting the survey on behalf of the Department of Transportation (DOT), which provided funding for helicopter time. If active dens are found, ENR will work with the Hunters and Trappers Committees and proponent to prevent disturbance of denning bears due to winter activities that may occur in 2014/2015 or determine alternative actions. These surveys have been conducted in areas with winter work since 2004, based on the recommendation of the Environmental Impact Screening Committee. If no work happens in the winter 2014/2015, this data will be added to the baseline information on grizzly bear denning in the area of the proposed highway.

OBJECTIVES:

- To determine locations of active dens in fall of 2014 in winter work areas.

METHODS:

DOT provided GPS data for survey area. Proposed highway work area, access roads, water lakes and gravel sources will be flown with a helicopter looking for active bear dens. The timing of the survey is critical. The bears must have dug their dens but the entrance to the den must still be visible. Some snow cover assists in the identification of dens but too much snow means they are no longer visible. Mid- to late October is the timing. Local assistance from both Tuktoyaktuk and Inuvik will be invited to participate this year.

Kavik-Stantec, on behalf of DOT, has developed a potential habitat map for grizzly bears in the development area. This, along with the criteria previously used for denning potential, will be used to determine flight lines.

Criteria:

- Change in elevation
- Stable substrate
- Vegetation
- South facing slope
- Historic denning in the area
- Different databases
- Experience of researchers in the area

RESULTS AND MAIN CONCLUSIONS:

Several dens were located during the survey and ENR worked with DOT, the Hunters and Trappers Committees and highway contractors to determine measures needed to mitigate and monitor the effects of highway construction on denning bears.

LONG-TERM PLANS AND RECOMMENDATIONS:

Results from the work will be stored in the Wildlife Management Information System and will be used to develop recommendations for mitigations and monitoring for future development.

Bear Denning Survey for the Mackenzie Valley Fiber Link

November 2014

MAIN INVESTIGATOR:

Marsha Branigan, Manager Wildlife Management,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500285

LOCATION:

Inuvik and Tsiigehtchic, NWT.

CONTACT:

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RATIONALE:

Project will collect data on bear denning activity in the vicinity of the proposed Mackenzie Valley Fiber Link (MVFL). ENR and Renewable Resources Council (RRC) observers will be conducting the survey on behalf of the GNWT, which is providing funding for the helicopter time. If active dens are found, the GNWT will work with the proponent to prevent disturbance of denning bears due to winter activities that may occur in 2014/2015 or determine alternative actions.

OBJECTIVES:

- To determine locations of active dens in fall of 2014 in winter work areas.

METHODS:

The GNWT provides GPS data for survey area. Proposed fiber link route will be flown with helicopter looking for active bear dens. The timing of the survey is critical. The bears must have dug their dens but the entrance to the dens must still be visible. Some snow cover assists in the identification of dens but too much snow means they are no longer visible. Mid- to late October is the ideal timing. Although this flight is later in the observation window, there is little enough snow that dens are still visible. Local RRCs will be invited to participate.

RESULTS AND MAIN CONCLUSIONS:

No active dens sites were identified along the portion of the route scheduled for construction in 2014/2015.

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring to continue during construction of the fiber optic link.

Bear Denning Survey, Tweed Lake M-47 Well Re-suspension

October 2014

MAIN INVESTIGATOR:

Nehkedi Environmental Ltd., Calgary, AB

WILDLIFE RESEARCH PERMIT NUMBER:

WL500297

LOCATION:

Nehkedi Environmental Ltd. (Nehkedi) was commissioned by Suncor Energy Inc. (Suncor) to undertake a bear denning survey within significant discovery licence 024 (SDL024), in the K'asho Got'ınę district of the Sahtú Settlement Area. Suncor will be conducting activities within SDL024 during the first quarter of 2015 to build a 15 km winter road and re-suspend the Tweed Lake M-47 well (the program). The well is located approximately 13 km south of the community of Colville Lake, NWT.

PARTNERS:

- The Colville Lake Renewable Resources Council provided a letter of support and a wildlife monitor.
- The Sahtú Renewable Resources Board provided a letter of support.

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RATIONALE:

The purpose of the bear denning survey was to make reasonable efforts to follow horizontal setbacks from bear dens during sensitive periods as outlined in the Sahtú Land Use Plan (SLUP) Conformity Requirement 7 (CR7) Fish and Wildlife. CR7 identifies October 15 to May 15 as a sensitive period for denning black and grizzly bears. During this sensitive period, the SLUP recommends a horizontal setback of 800 m from bear dens. Suncor will be conducting the program within SDL024 during the first quarter of 2015.

OBJECTIVES:

- To survey for bear dens or signs of denning bears within 800 m of the program area.
- To observe the potential for bear denning habitat.

METHODS:

Timing of the survey was based on the first accumulation of snow and a temperature drop to well below freezing. The survey was undertaken by air using an A-Star 350BA helicopter. Three observers (two Nehkedi biologists and one local wildlife monitor, Wilbert Kochon, from Colville Lake) conducted the survey. Wilbert Kochon assisted Nehkedi biologists with keen observational skills and local knowledge.

Photo: Byron Benn

Esker

Four transects were flown parallel to each side of the proposed winter road, for a total of eight transects, at approximately 200 m intervals. Transects were flown at an altitude of 60-90 m (200-300 ft.) AGL. Observers searched for signs of denning bears (e.g. holes, spoil piles, tracks leading to den site, etc.). Potential denning features such as large downed trees and rock outcrops as well as landscape features (e.g. hills, eskers) were circled to look for signs of dens.

RESULTS AND MAIN CONCLUSIONS:

Bear dens, or signs of denning bears, were not observed within the survey area. The survey area was mostly flat and considered to be poor denning habitat. Few good denning habitat features were present in the survey area. Several eskers were in the survey area and were circled. However, trees were relatively small, understory vegetation was sparse, and there was often a high percent cover of ground lichen.

Incidental observations of wildlife in the survey area included one marten and two herds of muskoxen.

Photo: Byron Benn

Muskox tracks on M-47 lease.

Photo: Byron Benn

North towards Colville Lake.

Nehkedi has submitted a follow-up report titled *2014 Bear Denning Survey, Tweed Lake M-47 Re-suspension, SDL 024, K'asho Got'ine District, Sahtú Region, Northwest Territories* to the GNWT and the Sahtú Renewable Resources Board. No further reporting or deliverables are anticipated.

LONG-TERM PLANS AND RECOMMENDATIONS:

In general, the program area was considered to be mostly unsuitable as denning habitat; therefore, additional bear denning surveys are not recommended prior to undertaking the proposed program in January 2015. The program will be completed by March 2015; therefore, long-term plans are not anticipated.

COMMUNITY INVOLVEMENT

Suncor hired a wildlife monitor for the bear denning survey through the Colville Lake Renewable Resources Council.

Inuvik to Tuktoyaktuk Highway Fall Muskrat Push-up Survey

November 2013 – January 2014

MAIN INVESTIGATOR:

Marcel Gahbauer, Senior Wildlife Biologist,
Kavik-Stantec Inc., Inuvik, NWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL500195

LOCATION:

The muskrat push-up study was done in two spreads on 33 lakes with the potential to be affected by Year 1 Inuvik to Tuktoyaktuk highway (ITH) construction. The two Year 1 proposed construction spreads were located at the south end of the proposed ITH route near Inuvik and at the north end near Tuktoyaktuk.

PARTNERS:

- Kavik-Stantec Inc.
- Tuktoyaktuk Hunters and Trappers Committee
- Inuvik Hunters and Trappers Committee
- EGT-Northwind Ltd.
- Aurora College

CONTACT:

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RATIONALE:

The GNWT Department of Transportation (DOT) is constructing a 140 km all-season highway, the ITH between the town of Inuvik and the hamlet of Tuktoyaktuk in the Inuvialuit Settlement Region. Construction is planned from 2013-2017, primarily during winter seasons. Muskrat are an important furbearer, and to a lesser extent, included in the traditional diets of Aboriginal peoples in the NWT. It is an important part of their health, culture and economy. From the working group, Environmental Impact Review Board, 2013, recommendations:

- **R25:** The developer shall complete pre-construction surveys for muskrat push-ups on lakes where winter snow removal and/or winter water withdrawal will take place.
- **R26:** The developer shall follow mitigation measures set out in permits issued under the *Wildlife Act* and monitor mitigation success, if muskrats are present.

To mitigate residual project effects to muskrats, DOT made a commitment to conduct pre-disturbance muskrat surveys.

OBJECTIVES:

To locate muskrat push-ups on those lakes proposed for winter snow removal and/or winter water withdrawal during Year 1 of construction. Information will be used by the project team to avoid and/or mitigate potential project interactions with muskrats and muskrat habitat.

METHODS:

Kavik-Stantec Inc. carried out ground-based muskrat push-up surveys by snowmobile on lakes proposed for winter road access and/or winter water withdrawal during Year 1 construction activity. A total of 33 lakes were identified for the Year 1 preconstruction survey: 26 in the northern spread and seven in the southern. Field crew included a Kavik-Stantec wildlife biologist, local Hunters and Trappers Committee (HTC) member and a local wildlife monitor.

The surveys were done after freeze-up with a thin layer of snow covering the ice. Surveys took place between November 26-28, 2013 on the northern spread and November 30 – December 1, 2013 on the southern spread.

Survey methods: consisted of circumnavigating the edge of withdrawal lakes with snowmobiles and searching for muskrat push-ups. For lakes proposed to be crossed by winter roads, searches were concentrated at the access points and up to 500 m along the shore on either side. The locations of muskrat push-ups or groups of push-ups were recorded with a GPS.

RESULTS AND MAIN CONCLUSIONS:

In all, 99 push-ups were observed on ten of 33 lakes (30.3%). In the southern survey area, 29 push-ups were observed on three lakes. In the northern area, 70 push-ups were observed on seven lakes. Most push-ups occurred singly or in pairs but several sites contained close groupings of larger numbers, which may indicate areas of higher quality habitat.

Muskrat push-up on Lake 57.

Photo: KAVIK-STANTEC Inc.

The number of push-ups observed on most of the surveyed lakes ranged between zero and seven. However, three of the lakes identified as potential water withdrawal sources had higher numbers of muskrat push-ups. Lakes S3, N1 and N3 contained 24, 25 and 17 observed push-ups, respectively, which may indicate larger muskrat populations in these lakes. Lake N1 is a relatively large lake (surface area 903.0 ha) where the muskrat population is unlikely to be affected by proposed winter water withdrawal because water levels would not change noticeably. However, lakes S3 and N3 are much smaller (surface area 19.5 ha and 56.1 ha, respectively) and there is potential for winter water withdrawal to affect muskrats and muskrat habitat.

LONG-TERM PLANS AND RECOMMENDATIONS:

The effects of water withdrawal on muskrat populations in shallow lakes are difficult to determine and would depend on the amount of water extracted and basin shape of the waterbody (Erb and Perry Jr. 2003). Although the proposed withdrawal volumes for lakes S3 and N3 are not great (8,000 m^3 and 2,000 m^3 respectively; GNWT 2013), there is the potential for habitat loss (Allen and Hoffman 1984) and increased mortality if muskrats are forced to seek out new overwintering wetlands (Cott et al. 2008). A precautionary approach of avoiding winter water extraction from Lakes S3 and N3 is recommended.

It is also recommended that proposed winter roads or access trails should be routed at least 25 m away from push-ups to avoid damage from vehicles and reduce potential sensory disturbance to muskrats.

Ongoing muskrat push-up surveys along proposed construction spreads are recommended prior to each winter of ITH construction to identify additional waterbodies of concern.

COMMUNITY INVOLVEMENT:

The impetus for this study was community concern about the potential effects of ITH winter construction on muskrat populations, a valued furbearer resource. By identifying waterbodies where project activities have the potential to interact with local muskrat populations, mitigation measures may be applied to reduce potential adverse effects.

Photo: KAVIK-STANTEC Inc.

Muskrat push-up on Lake N10.

Viscount Melville Sound Polar Bear Subpopulation Survey

09 April 2014 – 24 May 2014

MAIN INVESTIGATOR:

Jodie Pongracz, Regional Biologist,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500236

LOCATION:

Viscount Melville Sound, NWT. This was the third year of a three-year mark-recapture program to estimate the current population size of the Viscount Melville (VM) polar bear subpopulation. Field crews worked from three base camps: Polar Bear Cabins located at Wynniatt Bay on Victoria Island, Cape Providence on Melville Island and near Castel Bay in Aulavik National Park on Banks Island. The crews did not work from Mould Bay or Nias Point this year, however, the larger VM polar bear subpopulation region was still surveyed.

RATIONALE:

Sustainable management of harvested wildlife is dependent on current information concerning distribution, abundance and demographic parameters of wildlife populations. The most recent population estimate and demographic data for the VM polar bear subpopulation comes from mark-recapture research conducted from 1989-1992. In recent years the sea ice in the VM region has shifted from a multi-year sea ice to an annual sea ice system, remaining ice free in late summer. Currently, it is not known how the VM polar bear population is responding to these observed changes in sea ice habitat. It has been suggested that a shift from a multi-year sea ice system to an annual sea ice system may benefit polar bears in the short term by increasing the productivity of the sea ice environment. In order to assess whether the current allocated harvest of seven bears a year can be changed, a more detailed understanding of how bears in this population are responding to changing sea ice conditions and the historic management regime is required.

OBJECTIVES:

- To conduct mark-recapture to estimate the current population size and demographic parameters of the VM polar bear subpopulation.
- To assess the current boundaries of the VM polar bear subpopulation.
- To assess polar bear use of changing sea ice habitat in the area of VM Sound.

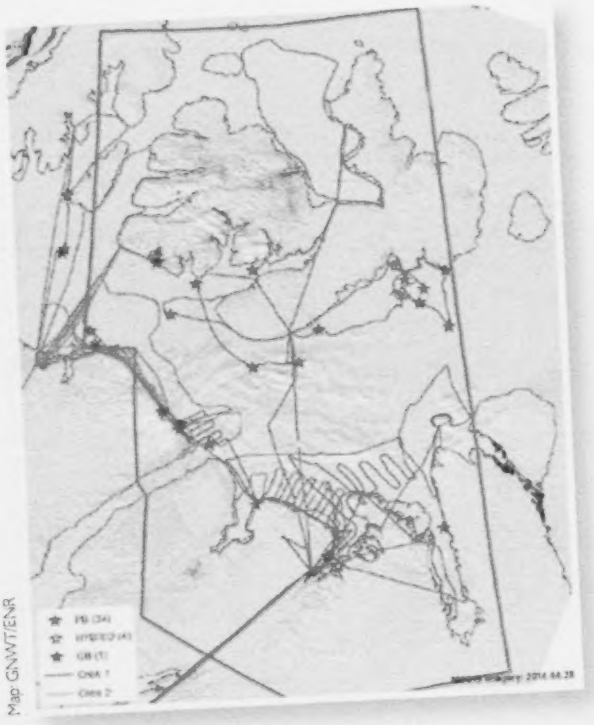
METHODS:

Survival, reproductive rates and the size of the VM polar bear subpopulation will be determined using a three year traditional mark-recapture (i.e., immobilization and tagging of bears) method.

This study also involved the deployment of 25 satellite radio collars on adult female polar bears from the VM region to examine polar bear habitat use, distribution and movement rates, and subpopulation delineation. These data will allow researchers to assess whether the existing boundary for the VM polar bear subpopulation is adequate and the extent to which polar bears use both multi-year and annual sea ice.

RESULTS AND MAIN CONCLUSIONS:

Crew 1 experienced some helicopter issues and had to return to Ulukhaktok for a few days at the start of the program. Many days were not suitable for flying (did not fly 32 of 44 days in the field camp due to poor weather). Overcast conditions prevailed with white conditions on the ice and many days with high winds. Some days worked were shorter due to deteriorating weather conditions. Two drums of jet fuel cached in March 2014 were missing when the helicopter arrived at Hadley Bay (south) and snowmobile tracks were visible. Crew 2 spent three weeks at Polar Bear Cabin in Aulavik but only worked eight days due to weather. The crews had clean-up work to do as well to prepare caches for clean-up by fixed wing.



Tracks flown and locations of polar, grizzly and hybrid bears captured during spring 2014.

A total of 34 bears were captured in spring fieldwork, of these 30 were within VM. VM bears were sighted in 20 groups. An additional five collars were deployed on adult female polar bears throughout the region; one adult female was re-collared. Five bears were recaptures (previously captured during 2012 or 2013 in the VM region). These included an adult female with a two-year-old, a subadult and two adult males. Four bears were captured just west of the study region (unintentionally outside of the study area).

PARTNERS:

- Olokhatomiut Hunters and Trappers Committee in Ulukhaktok (OHTC)
- Ekaluktutiak Hunters and Trappers Organization in Cambridge Bay (EHTO)
- Inuvialuit Game Council
- Aboriginal Affairs and Northern Development Canada
- Environment Canada
- Government of the Northwest Territories
- Nunavut Wildlife Management Board
- Polar Continental Shelf
- University of Alberta
- Wildlife Management Advisory Committee (NWT) – Inuvialuit Implementation funds
- World Wildlife Fund

CONTACT:

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Four stationary collars were picked up and in all cases no evidence of mortality was seen. Crew 1 navigated to two stationary collars and Government of Nunavut staff picked up the other two in the M'Clintock Channel area. Crew 1 observed four individuals with signs of hair loss (location: ears (2), top of head (1) and neck (1)).

Sea ice was consolidated in the VM Sound. Polynyas in Wynniatt Bay were frozen over and there was no open water or moving ice on the south side of VM Sound. No large pans of multiyear sea ice were observed in VM Sound as was the case in spring 2012. There was an area of active ice to the east of Winter Harbour where there was increased bear activity (tracks and kills) along two large cracks along the coast where nine bears were captured in one day. There were also cracks observed in Liddon Gulf which was not the case in previous springs. Overall, there were far more seals observed than in previous springs throughout the northern half of the study region, including north of Melville Island in Hecla and Griper Bay. However, no prominent pressure ridges occurred through the larger bays (Liddon Gulf, Wynniatt Bay, Hecla and Griper Bay) as were observed in previous springs. Overall, tracking conditions were poor in the eastern half of the study area but were better in the western half where the field crew were able to track out several bears. A handful of seal kills were observed by the field crew in the eastern half of the study area, however, only one fresh kill was observed by the crew covering the west half.

During the VM survey work in 2014, one adult male grizzly bear was captured off Parker Point. One female hybrid bear (F1) was captured with three cubs-of-the-year (F2s) that looked like grizzly bears. The female was collared but unfortunately dropped her collar shortly thereafter.

LONG-TERM PLANS AND RECOMMENDATIONS:

We are currently analyzing data and samples collected. We partially completed the project clean up and demobilization.

COMMUNITY INVOLVEMENT:

Prior to research commencing, we held community consultations in both Cambridge Bay and Ulukhaktok. The objective of the meeting was to get direction from the OHTC, EHTO and both communities as to whether they thought the research should occur and what methods should be used. Both communities and respective HTO/HTCs approved of the research and gave the ENR direction to proceed with an initial year of traditional mark-recapture methods and deploy 25 satellite-GPS collars on adult female polar bears.

In August of 2012 the project leaders attended the Inuvialuit-Inuit polar bear management meetings in Tuktoyaktuk, where results of the first field season of the VM polar bear project were presented to the commissioners of the agreement from Ulukhaktok and Cambridge Bay.

Research planning meetings with the OHTC, EHTO and public meetings in both Ulukhaktok and Cambridge Bay were held in January 2013. It was determined a traditional mark-recapture program would continue with deployment of remaining collars. During spring 2013 we also worked with the OHTC and EHTO to pilot a hair snag project. The hair snag project was logistically challenging, of limited success and was not continued in 2014.

Upon completion of field seasons, field reports were provided to the OHTC, EHTO as well as to the Inuvialuit Game Council and Wildlife Management Advisory Council (NWT).

Small Mammal and Hare Surveys

June 2014 – September 2014

MAIN INVESTIGATOR:

Suzanne Carrière, Wildlife Biologist (Biodiversity), Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL500254

LOCATIONS:

Sahtú

Norman Wells: 65° 18'N, 127° 20'W
Tulít'a: 64° 54'N, 125° 34'W*

North Slave

Yellowknife: 62° 24'N, 114° 26'W
Tibbitt Lake: 62° 34'N, 113° 20'W Hare only
Daring Lake: 65° 00'N, 111° 30'W Arctic hare special

Dehcho

Fort Liard: 60° 39'N, 117° 29'W*
Fort Simpson: 62° 00'N, 122° 00'W
Trout Lake: 60° 26'N; 121° 15'W*

South Slave

Fort Smith: 60° 01'N, 111° 54'W
Fort Resolution: 61° 10'N, 113° 40'W
Fort Providence: 61° 20'N, 117°40'W Hare only
Kakisa: 61° 00'N, 117° 20'W*
Tsu Lake: 60° 35'N, 111° 53'W
Wood Buffalo National Park (AB): 59° 57'N, 111° 40'W

Inuvialuit-Gwich'in

Inuvik: 68° 18'N, 133° 29'W

* Survey not performed in 2014 due to personnel unavailability.

All surveys were done between June 1 – August 31, 2014.

OBJECTIVES:

The NWT small mammal survey (SMS) monitors changes in density of voles, mice, lemmings and shrews across five ecozones in the NWT. The hare transect survey (HTS) monitors snowshoe hare density across all forested ecozones and an abundance index for Arctic hare at the tundra site.

METHODS:

Small mammal data is collected using snap-traps or live traps and reported as the number of trapped specimens per 100 trap-nights (capture index). Monitoring is done on standardized permanent trap lines. Usually, 100 traps are out for five nights. Trap lines are checked at least each morning before 10:00 a.m. The trapping is planned for August each year, but at some sites the survey is performed in June, July or September if other activities require a change in timing.

Hare data is collected on four transects at each site. Each transect consists of 20 permanent quadrats measuring 5.1×305.0 cm oriented along transect and evenly spaced 15-30 m apart. Hare fecal pellets deposited within each quadrat are then counted and cleared from the quadrat. The number of pellets per quadrat is then correlated to an estimate of hare density (number of hare per hectares) at each site.

RESULTS AND MAIN CONCLUSIONS:

In summer 2014, small mammal numbers were medium or low across the NWT.

Peaks in hare numbers occurred in the NWT every ten years or so, in 1962, 1971, 1980, 1990, and then in 1999-2000. Hare populations across the NWT remained low between 2002-2006, but increased rapidly in 2009 and may have peaked in 2010. This latest peak in numbers is not as high as in previous decades. Lower peaks are also observed in the Yukon. The hare numbers were low in 2011-2012 but both survey results and reports from NWT residents indicate that they are increasing again.

Published in 2014:

Charles J. Krebs, et al. 2014. What factors determine cyclic amplitude in the snowshoe hare *(Lepus americanus)* cycle? Canadian Journal of Zoology 92: 1039-1048.

Survey data were shared for: NWT State of the Environment Report – Available at www.enr.gov.nt.ca.

LONG-TERM PLANS AND RECOMMENDATIONS:

This survey is part of long-term efforts to monitor the natural fluctuations in both forested and tundra ecosystems in the NWT. Plans are to continue the survey and expand the number of sites with community advice. The survey will be expanded to include communities who request it.

The information from both hare and SMS are used in many other projects. For example, to predict furbearer abundance in the NWT. Other agencies or organizations also rely on results from the SMS and hare surveys to complement their studies.

PARTNERS:

- Department of Environment and Natural Resources
- Ka'a'gee Tu First Nation
- Sahtú Renewable Resources Board
- Gwich'in Renewable Resources Board
- Aurora College in Fort Smith

CONTACTS:

Daring Lake: Karin Clark and Steve Matthews (coordinator for ENR) and Daring Lake Tundra Science Camp
Fort Providence: Shelby Skinner, Sarah Taylor (ENR, Students)
Fort Resolution: Karl Cox, Jordyn Siurko (ENR, South Slave)
Fort Simpson: Danny Allaire (ENR, Dehcho)
Fort Smith: Karl Cox, Heather Beck (ENR, South Slave)
Inuvik: Kristen Callaghan, Alicia McRae, Ryan Brooks (Gwich'in Renewable Resources Board)
Tibbitt Lake: Shelby Skinner, Sarah Taylor (ENR Students), Angus Smith (ENR Intern)
Tsu Lake: Linh Nguyen (coordinator, Aurora College)
Norman Wells: Stephanie Behrens (ENR Sahtú), Julian Behrens, Katrina McDonald (RRC Youths), Lisa McDonald (RRC Representative)
Yellowknife: Suzanne Carrière (ENR Wildlife), Shelby Skinner, Sarah Taylor (ENR Students), Robert Reid (volunteer)
Wood Buffalo National Park (on Alberta side): Parks Canada staff

CONTACT:

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Banks Island Muskox and Caribou Population Survey

July 2014

MAIN INVESTIGATOR:

Tracy Davison, Regional Biologist,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500145

LOCATION:

Survey was conducted on Banks Island, NWT.

PARTNERS:

This study was funded by Inuvialuit Wildlife Studies Funds and ENR.

This project was undertaken with the financial support of the Government of Canada through the federal Department of Environment and Parks Canada Agency.

CONTACT:

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RATIONALE:

Peary caribou are classified as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) based on overall declines of 72 percent since 1961. The last population survey on Banks and northwest Victoria Island was conducted in 2005. This survey provides population estimates that allow assessment of the status and recovery of the species.

OBJECTIVES:

- To update the population estimate for Peary caribou and muskoxen.

METHODS:

A strip transect aerial survey was flown by two crews using a Helio-Courier and Turbo Beaver fixed wing aircrafts. Survey lines were spaced 5 km apart. Observers were seated on each side of the aircraft and observations within a 500 m strip on each side of the aircraft were considered on transect. Observations beyond 500 m were considered off transect. Caribou were classified as bulls, adults (cows/young bulls) or calves. Muskoxen were classified as adults or calves. All other wildlife sightings were recorded. Population estimates for each species were calculated using adult observations only.

RESULTS AND MAIN CONCLUSIONS:

There were 439 adult caribou (and 95 calves) seen on transect giving a population estimate of 2,234±830 (95% confidence interval) non-calf caribou on Banks Island. There were a total of 2,705 adult muskoxen (and 294 calves) observed on transect yielding a population estimate of 13,767±1,938 (95% confidence interval) non-calf muskoxen on Banks Island. Survey results show a large decline in muskoxen on Banks Island from the 2010 survey results of 36,676±4,031. The number of Peary caribou, however, has increased from the 2010 survey results of 1,097±343 (Davison et al. 2013).

Other mammal species observed during the survey included one grizzly bear, one fox, 15 adult wolves, six polar bears, one seal and three belugas.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continued monitoring of Peary caribou and muskox on Banks Island at regular intervals is recommended along with continued investigation into the possible causes of the muskox decline.

COMMUNITY INVOLVEMENT

Field assistants from Sachs Harbour participated in the survey.

Dall's Sheep Survey in the Richardson Mountains

June 2014

MAIN INVESTIGATOR:

Kristen Callaghan, Wildlife Biologist,
Gwich'in Renewable Resources Board, Inuvik, NWT,
and Tracy Davison, Regional Biologist,
Environment and Natural Resources,
GNWT, Inuvik Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500257

LOCATION:

Northern Richardson Mountains, NWT and Yukon.

PARTNERS:

- Environment and Natural Resources
- Gwich'in Renewable Resources Board (GRRB)

CONTACTS:

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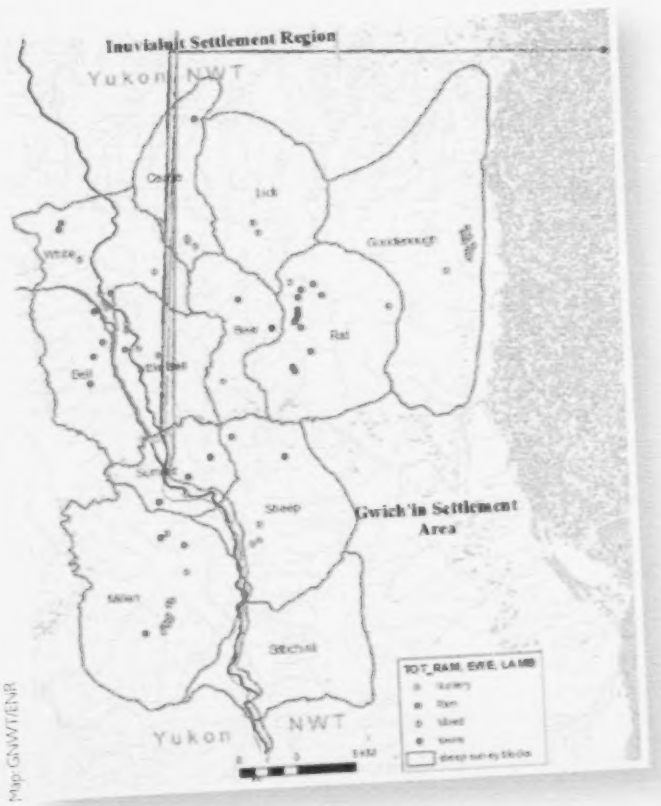
RATIONALE:

The Dall's sheep population in the Richardson Mountains is relatively small and isolated at the northern end of the species range. It has a high cultural and traditional value for northern people, and a number of sheep are harvested each year by Gwich'in and Inuvialuit in the NWT. There are also local reports of a limited sheep harvest by Vuntut Gwich'in from Old Crow, Yukon.



Surveyed areas in the Richardson Mountains for Dall's sheep.

The GNWT and the Yukon Territorial Government (YTG) have been monitoring the Dall's sheep population in the Richardsons since 1984 with assistance in recent surveys from the GRRB. The entire area was surveyed in June 1984, June 1985, June 1986, August 1991, June 2001, August 2003, June 2006 and June/July 2010. In August 1997, only the survey blocks that fell primarily in the NWT could be surveyed because of bad weather. In this area the Dall's sheep population increased from 418 animals in 1984 to 1,339 in 1997, a three-fold increase. The estimated total population in 1997, based on historic distributions, was 1,573. The overall population surveyed has varied from 802 in 1986 to an estimated high of 1,573 in 1997 and down to an observed count in 2010 of 699. Since 1997, the population declined.

OBJECTIVES:

- To estimate population abundance of Dall's Sheep in the northern Richardson Mountains and sex/age structure.

METHODS:

The northern Richardson Mountains were surveyed June 2014 with a helicopter to locate and classify sheep. Contours and drainages were flown in survey blocks. Two trained biologists were in the aircraft to spot and classify the sheep. One community assistant was also hired to help locate sheep. Sheep were classified as ewes, lambs, ½ curl, ¾ curl and full curl rams.

RESULTS AND MAIN CONCLUSIONS:

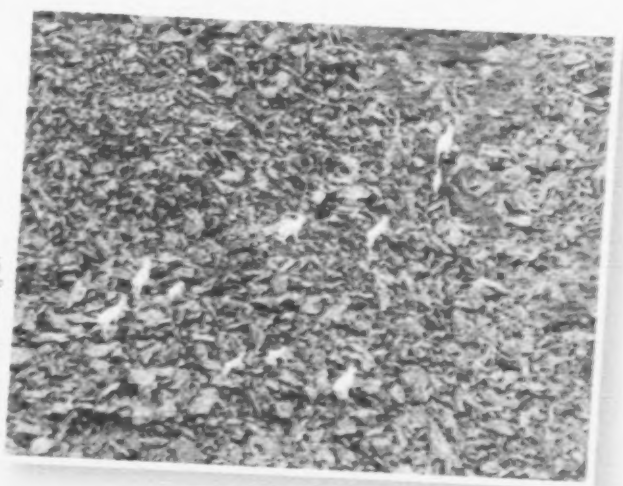
The survey was conducted in the northern Richardson Mountains between June 16-23. A total of 496 sheep were observed: 259 nursery sheep (ewes, yearlings, and young rams); 92 lambs; 112 rams; and, 33 unclassified adult sheep compared to a total of 699 sheep observed in 2010. Other wildlife observed during the flights: 71 muskox (including 14 calves); 33 grizzly bears (including 13 cubs); one wolf; one wolverine; and, 38 bull caribou.

LONG-TERM PLANS AND RECOMMENDATIONS:

The current population size of 496 sheep is a concern. The population has steadily declined since an observed peak in 1991. The observed population size has decreased by 29 percent since 2010 (including 39 percent decline of lambs and 26 percent decline of adults). Increased monitoring as suggested in the draft interjurisdictional management plan for Dall's sheep is proposed.

COMMUNITY INVOLVEMENT:

A field assistant from Aklavik assisted with the survey.



Dall's sheep.

Photo: GRRB, Kristen Callaghan

Mackenzie Mountain Dall's Sheep Monitoring

June 2014

MAIN INVESTIGATOR:

Heather Sayine-Crawford,
Manager Wildlife Research and Monitoring,
Environment and Natural Resources,
GNWT, Sahtú Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500244

LOCATION:

The two study areas, Katherine Creek and Palmer Lake, are accessed by helicopter from the nearest community, Norman Wells. The Katherine Creek study area measures 393.3 km^2 in area (65.0°N, 127.6°W) and is approximately 48 km from Norman Wells. The Palmer Lake study area measures 395.8 km^2 in area (64.5°N, 129.4°W) and is approximately 150 km from Norman Wells.

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RATIONALE:

In 1997 ground-based Dall's sheep surveys were started in three mountain blocks within the Mackenzie Mountains. Two of these mountain blocks, the Katherine Creek and Palmer Lake study area, are still surveyed today. These surveys give wildlife managers information on these two populations, including numbers of sheep as well as recruitment and sex ratios. The main human influence on the Dall's sheep of the Mackenzie Mountains is through harvest, both sport and subsistence. The levels of sheep harvest are quite low in the Mackenzie Mountains but it remains important to monitor this species so that they continue to be properly managed.

OBJECTIVES:

- To obtain estimates of sex ratios and recruitment rates in both the Palmer Lake and Katherine Creek study areas.
- To obtain basic biodiversity information about the presence of other species in the study area.

METHODS:

Crews of two to four people will travel to each study area for eight to 14 days. Crews survey the entire study area on foot using binoculars and spotting scopes to locate and classify sheep. Observers attempt to get close enough to ensure proper classification without disturbing the Dall's sheep. Individuals are classified as lamb, yearling, ewe, ¼ curl ram, ½ curl ram, ¾ curl ram or full curl ram. Sex and age of sheep are determined by horn characteristics, body size and behaviour and, when possible, through the observation of reproductive organs. Any sheep that cannot be identified are recorded but not used in estimates for recruitment or sex ratios.

RESULTS AND MAIN CONCLUSIONS:

Katherine Creek study area: Only 26 animals were observed, four lambs, three yearlings, 11 rams and six ewes were classified. This is the lowest number of animals observed within this study area.

Palmer Lake study area: 241 animals were observed, resulting in a lamb:ewe ratio of 46 lambs per 100 ewes, a yearling:ewe ratio of 42 yearlings per 100 ewes and a sex ratio of 46 rams per 100 ewes. The number of animals observed within the Palmer Lake study area in 2014 was the most observed since 2006 (with no data collected in 2008).

LONG-TERM PLANS AND RECOMMENDATIONS:

ENR plans to continue to monitor the two Dall's sheep study areas.

COMMUNITY INVOLVEMENT:

Contact was made with required communities prior to beginning surveys and permission was granted.

Dall's sheep surveyed in the Mackenzie mountains.

Photo: GNWT/A. Sayine-Crawford, ENR

Moose Population Monitoring

August 2013 – August 2014

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring,
Environment and Natural Resources,
GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500182

LOCATION:

Dehcho region, NWT. Aerial survey areas focus on the Mackenzie and Liard River extended corridors. Samples are collected from moose harvested throughout the entire region.

PARTNERS:

- The Acho Dene Koe Band,
- Nahanni Butte Dene Band,
- Jean Marie River First Nation,
- Liidlii Kue First Nation,
- Fort Simpson Métis Local, and
- Pehdzeh Ki First Nation

have provided observers for aerial surveys and local members have provided samples from harvested moose for the contaminants portion of the study.

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RATIONALE:

Moose are a highly sought after and primary traditional country food source of resident hunters in the Dehcho, unlike in other regions of the NWT, however moose in this region are frequently harvested by hunters that reside in other regions. Hunting pressure on moose has unquestionably increased since the first moose surveys. With the recent restrictions on barren-ground caribou and wood bison harvest in other regions of the NWT, and impending resource development, there is a real concern moose populations will be depressed in the Dehcho. A long-term monitoring program was established (Larter 2009) which included large-scale surveys conducted once every six years and small-scale monitoring surveys conducted at intervals between the large-scale surveys. Baseline contaminant levels were determined for moose harvested during 2004-2007. Based on a resulting public health advisory, contaminant levels in harvested moose were to be revisited over a five to six year period to ensure moose harvested in the Mackenzie and Liard River valleys remain a healthy country food choice.

Photo: GNWT/D. Allaire, ENR

Moose surveyed in the Dehcho region.

Photo: GNWT/D.Allaire, ENR

Moose monitoring survey crew.

OBJECTIVES:

- To monitor the density and distribution of moose in areas north of the Mackenzie River, including the proposed pipeline right-of-way, and areas in the Liard Valley deemed to be important by local First Nations.
- To derive estimates of cow: calf ratios during early winter in the Mackenzie and Liard Valleys.
- To collect various biological samples from moose harvested throughout the region in order to address local concerns about the health and condition and the levels of various contaminants found in a primary country food resource.

METHODS:

- Surveys use ~16 km^2 sample blocks as the sampling unit. A total count is done on each unit.
- Units for small-scale surveys are randomly selected from within the vicinity of each community in the study area: Wrigley; Fort Simpson; Jean Marie River; Nahanni Butte; and Fort Liard.
- Units for large-scale surveys are randomly selected from the ~23,000 km^2 and ~9,500 km^2 Mackenzie and Liard study areas, respectively.
- We estimate density and the number of calves per 100 adult females from the aerial surveys.
- The following samples are collected in provided sample kits: incisor bar; 15 cm leg bone with marrow; 10x10 cm pieces of liver and muscle; and, fecal pellets.
- Harvesters provide a body condition rating, date, location and sex of kill and receive $75/set.

Photo: GNWT/D.A...are, ENR

Fueling up the plane before heading out on a moose survey.

Photo GNWT/D Allaire ENR

Caribou observed during the moose survey

- Teeth aged by cementum, bone marrow fat content and fat:kidney determined.
- Kidney, liver and muscle tissues analyzed for 33 elements by spectrometry.
- Muscle tissues are analyzed for radionuclides using direct gamma spectrometry.
- Fecal samples are analyzed for parasites.

RESULTS AND MAIN CONCLUSIONS:

Small-scale aerial survey conducted November 18-23, 69 blocks surveyed; survey coverage 16%.

- We observed a total of 85 moose, not all were found within the survey blocks.
- Two sets of moose twins observed but estimate of 26.3 calves per 100 adult females is lower than in previous years.
- Lab analyses have been completed on biological samples.

Photo: GNWT/D.Allaire, ENR

Fueling up the plane.

COMMUNITY INVOLVEMENT:

Communities wanted to be involved with moose surveys and community members participate as observers during aerial surveys for moose. Community members are concerned about the quality of the moose meat they consume. Local harvesters are providing samples from moose harvested so they can be tested for various contaminants.

LONG-TERM PLANS AND RECOMMENDATIONS:

Continued monitoring of cow:calf ratios and moose density will include another small-scale survey scheduled for winter 2015/2016 and a large-scale survey scheduled for 2017/2018.

Biological samples will be collected from harvested moose through winter 2015 in order to meet our goal of samples from 45-50 harvested moose. Samples will be submitted to various labs for a variety of analyses. The results from the current harvest samples will be provided to appropriate public health authorities and compared with those from moose harvested during 2004-2007.

Moose survey crew members waiting to fly.

Photo: GNWT/D.Allaire, ENR

Cooperative Waterfowl Population Surveys in the Northwest Territories

June 2014

MAIN INVESTIGATOR:

Mark Koneff, Chief, Migratory Bird Survey Branch, United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500246

LOCATION:

The survey covers much of the Mackenzie Valley region from the southern border of the NWT to the Mackenzie Delta region. The survey in the NWT is part of the waterfowl population survey program. This program conducts annual aerial surveys for waterfowl in many of the important waterfowl breeding areas in North America.

PARTNERS:

- United States Fish and Wildlife Service
- Canadian Wildlife Service

CONTACTS:

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RATIONALE:

The NWT is one of the most important breeding and summering areas for ducks, geese and swans in North America. Information on bird numbers, distribution and population trends is needed to determine if current harvest levels are sustainable. This will help ensure waterfowl populations are conserved for the long-term use and appreciation by northern residents and all other people residing within the migratory range of these species.

OBJECTIVES:

- To determine the species, number of ducks and other waterfowl in the Mackenzie River drainage during the breeding season.

METHODS:

The survey followed standard operating procedures for aerial waterfowl surveys. A small airplane flew a single pass along straight-line transects at a height of 46 m (150 ft.). Two observers recorded the number and species of waterfowl observed within 200 m (660 ft.) on each side of the aircraft. The location of all observations was also recorded.

RESULTS AND MAIN CONCLUSIONS:

Spring 2014 came exceptionally late over most of the region, even more so than the spring of 2013. A prolonged winter and one of the latest break-ups in years was a reoccurring comment we heard as we progressed through the survey. Smaller wetlands thawed first and birds seem to immediately occupy these desirable habitats. Larger lakes were slower to thaw as usual and birds were also observed in good numbers in these shoreline habitats. The habitat ranked good throughout the region. No significant spring flooding was observed on the Mackenzie River Delta.

The 2013 total breeding duck estimate in central and northern Alberta, northeastern British Columbia, and the NWT was 19 percent higher than the 2013 estimate and 39 percent higher than the long-term average. (1955-2013). Mallard numbers were 72 percent higher than 2013 and 62 percent above the long-term average. American wigeon numbers were 42 percent higher than the 2013 estimate and 75 percent higher than the long-term average. Green-winged teal numbers were 40 percent higher than 2013 and 112 percent above the long-term average. Northern shoveler numbers were similar to the 2013 estimate and 67 percent above the long-term average. Northern pintails were similar to 2013 and the long-term average. Canvasback numbers were similar to last year and to the long-term average. The scaup estimate was similar to last year but 16 percent below the long-term average.

The *2014 Waterfowl Population Status Report* as well as previous status reports can be accessed online at: www.fws.gov/migratorybirds/NewReportsPublications/PopulationStatus.html.

LONG-TERM PLANS AND RECOMMENDATIONS:

The waterfowl population survey program has evolved into the largest and most reliable wildlife survey effort in the world. For more than 50 years, cooperative waterfowl surveys have been performed by United States Fish and Wildlife Service, Canadian Wildlife Service, state and provincial biologists and non-government partners. Survey results determine the status of North America's waterfowl populations, play an important role in setting annual waterfowl hunting regulations and help guide the decisions of waterfowl mangers throughout North America. The surveys are planned to continue annually.

COMMUNITY INVOLVEMENT:

Canadian Wildlife Service has reviewed all concerns and comments provided by the communities and have discussed solutions directly with them. The main concerns received by the communities are opportunities for local hiring and potential disturbance to wildlife. The United States Fish and Wildlife Service are unable to hire local help because of liability and legal issues as well as constraints in the United States civil service hiring regulations. It is expected the surveys will have a negligible effect on waterfowl and other wildlife because transects are widely spaced over a vast area and areas are only surveyed once annually.

Western Canada Cooperative Waterfowl Banding Program at Willow Lake, Sahtú Settlement Area

August 2014 – October 2014

MAIN INVESTIGATOR:

Nathan Zimpfer, Waterfowl Biologist,
United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500273

LOCATION:

Near the outlet of Willow Lake, 65° 14'N, 125° 25'W, situated about 40 km north of Tulít'a, NWT.

PARTNERS:

- Tulít'a Renewable Resources Council
- United States Fish and Wildlife Service
- Sahtú Renewable Resources Board
- Environment and Natural Resources

CONTACT:

Nathan Zimpfer, Waterfowl Biologist
United States Fish and Wildlife Service
Division of Migratory Bird Management
11510 American Holly Drive
Laurel, MD 20708

RATIONALE:

The Willow Lake banding station is one of several banding stations located in Western Canada and the NWT. The data generated, resulting from the harvest of waterfowl and reporting to the Canadian Bird Banding Office or United States Bird Banding Laboratory, are used to monitor the vital rates, population status, distribution and corridors utilized by migratory waterfowl. This information, in conjunction with aerial spring surveys, is used to aid those responsible for setting appropriate waterfowl harvest regulations in the United States and Canada. This information has also been valuable in assisting efforts to protect habitats by joint ventures through the North American Waterfowl Management Plan. 2014 will mark the 16th year waterfowl banding has occurred at Willow Lake.

OBJECTIVES:

The Western Canada Cooperative Banding Program sets annual banding objectives. The objective for the Willow Lake stations is to band 2,000 mallards, 2,000 northern pintails and all incidentally captured waterfowl (preferably 1,000 per species), prior to the opening of duck hunting season (September 1 annually).

METHODS:

Trap-sites have been selected in the Willow Lake area based upon the requirements of the traps, traditional environmental knowledge and local knowledge of the area. Collapsible B-2 funnel traps are baited with germ-free cleaned barley. Trapping operations consume about 2,250 kg (*ca.* 5,000 lbs.) of barley. Traps are checked at least once a day and all captured ducks are removed, banded, documented and released. Field data are entered on banding schedules and transcribed into the BANDIT software, which are forwarded to the Canadian Wildlife Service Bird Banding Office at the completion of trapping operations in accordance with the conditions of the banding permit. An annual report will be presented to the Sahtú Renewable Resources Board, Tulít'a Renewable Resources Council, United States Fish and Wildlife Service, Canadian Wildlife Service Banding Office and other interested groups.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Canadian Barrenlands Breeding Sea Duck Survey in the Northwest Territories

June 2014 – July 2014

MAIN INVESTIGATOR:

Walt Rhodes, Flyway Biologist,
United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500259

LOCATION:

The survey was conducted approximately 150 km east of Łutselk'e towards the border of Nunavut.

PARTNERS:

- United States Fish and Wildlife Service
- Canadian Wildlife Service

CONTACT:

Cindy Wood, A/Population Management Biologist (Waterfowl)
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RATIONALE:

The NWT is one of the most important breeding and summering areas for ducks, geese and swans in North America. Information on bird numbers, distribution and population trends is needed to determine if current local and international harvest levels are sustainable and to ensure populations are conserved for the long-term use and appreciation by northern residents and all the other people residing within the migratory range of these species. To successfully conserve and manage populations, waterfowl numbers have been monitored annually since 1955 in the NWT through low intensity surveys with fixed wing aircraft. The NWT surveys are part of a broader program, which covers much of the important waterfowl breeding habitat in North America. However, this survey is of limited value for monitoring breeding sea duck populations due to transect locations and timing of the survey, which is typically too early to adequately monitor late-nesting waterfowl such as sea ducks. Recent satellite telemetry studies indicate the majority of black scoters marked in the Great Lakes and Atlantic regions migrate to breeding sites just outside of the traditional survey area. Information suggests other sea duck species, such as long-tailed ducks and surf scoters, also breed in this region. Aerial surveys are required to determine the extent of the breeding area and relative breeding densities for sea ducks and other waterfowl species nesting in this region.

OBJECTIVES:

- To determine the extent of breeding area and relative breeding densities for black scoters and other waterfowl species.

METHODS:

The survey procedure involves flying a single pass along straight transects in a Quest Kodiak amphibious aircraft at a height of 150 ft. The low survey intensity will result in minimal disturbance to birds and other wildlife. These surveys follow the same procedures as the breeding population surveys that have been carried out since the mid-1950s, and will add important information to the database for the continental management of waterfowl.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Abundance and Productivity of Waterfowl and Other Aquatic Birds Breeding in the Boreal Forest

May 2014 – August 2014

MAIN INVESTIGATOR:

Myra Robertson, Waterfowl Population Biologist, Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500251

LOCATION:

The area within 400 m of each side of the Yellowknife highway starting 16 km west of Yellowknife and going westward along the highway for 48 km.

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RATIONALE:

There is a severe lack of information on the ecology of northern ducks and other aquatic birds, such as grebes and loons, and the contribution of boreal populations to the overall North American populations of aquatic birds is largely unknown. Similarly, the factors influencing the size and productivity of northern duck populations (including the impact of spring harvest) are poorly understood. A good long term database is required for the conservation of this valuable resource.

Until recently, geese of the species *Branta canadensis* (Canada geese) breeding in Canada were recognized as a single species. In 2003, after review of genetic evidence, it was split into two species of geese (*B. canadensis* – Canada and *B. hutchinsii* – cackling). The many different races of these two geese species are grouped into 15 different management populations in Canada. One such management population, the short-grass prairie population, breeds throughout our area from northern Alberta to the Inuvialuit Settlement Region. This population is thought to be comprised of a mixing of the two species. Opportunistic samples are required from our area to delineate the distribution of these two species, which in turn will better enable us to manage the population.

OBJECTIVES:

- To determine factors that limit the size, composition, and productivity of the breeding populations of aquatic birds near Yellowknife.
- To delineate the distribution of breeding Canada and cackling geese throughout the NWT.

METHODS:

Roadside counts will be done in May to determine the timing of migration and breeding for waterfowl. Surveys by foot and canoe will be done monthly during the breeding season to determine breeding chronology and seasonal trends in waterfowl use of the area.

In support of a continent-wide study of Canada goose taxonomy, a maximum of one egg might be collected opportunistically from any Canada/cackling goose nest found during the study.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Western Canada Cooperative Preseason Waterfowl Banding Program (Mills Lake, NWT)

7 August 2014 – 25 August 2014

MAIN INVESTIGATOR:

David Fronczak, Wildlife Biologist,
United States Fish and Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500272

LOCATION:

Mills Lake, NWT, 21 miles WNW of Fort Providence, NWT. Banding was conducted within the marsh on the east end of the lake.

PARTNERS:

- South Slave region – GNWT (permits)
- Fort Providence community (supplies, gas, and logistical assistance)
- United States Geological Survey, Bird Banding Laboratory (bands)

CONTACT:

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RATIONALE:

Preseason waterfowl banding at Mills Lake, NWT has been an ongoing event since 1964. Within the 40 years of operations, approximately over 88,000 waterfowl have been banded. Recovery information is used to help determine migration routes, assess harvest pressure, measure vulnerability to harvest pressure, estimate waterfowl production rates and estimate survival rates of a breeding population. Mills Lake has proven to be an important area towards the overall waterfowl population monitoring program by providing a cost effective way to sample a segment of the boreal breeding population.

OBJECTIVE:

To preseason band 1,000 mallards (of each cohort) for the combined banding effort within the NWT.

Mills Lake duck band recovery locations

Photo USFWS Migratory Bird Management

Baited wire funnel trap with waterfowl waiting to be banded.

METHODS:

Waterfowl were trapped within baited wire funnel traps. Traps were placed in strategic areas within the marsh and then checked daily after baiting has been initiated. Caught birds are then herded into a catch box for processing. Biological information such as species, age, sex, date and location are then recorded for each bird. A federal aluminum band is placed on the bird's leg and the bird is then released. Each band has a unique number, which links the collected biological information to that bird. Persons encountering banded birds are highly encouraged to report that band's number back to a wildlife agency (GNWT) or to the Canadian Wildlife Service's Banding Office, 1-800-327-band or at www.reportband.gov.

RESULTS AND MAIN CONCLUSIONS:

A total of 1,349 ducks (1,200 mallard, 107 northern pintail, 20 American green-winged teal, five American wigeon, 16 blue-winged teal, and one canvasback) and one American coot were banded over a 13-day period (August 12-25). For mallard and northern pintail, the percentage of young totaled 54 percent, and 40 percent, respectively. Twenty previously banded ducks were captured, consisting of 17 mallard and three northern pintail. Water conditions in the marsh were considered below normal. There were fewer birds that used Mills Lake and Mills Lake marsh compared to previous years. Detailed information can be obtained from the *Mills Lake 2013 Preseason Banding Report* from the South Slave GNWT office.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans include the continuation of annual preseason banding at Mills Lake, NWT. Mills Lake is a unique staging area for waterfowl and logistically feasible for gathering pertinent information on waterfowl for population monitoring/management that pertains specifically to the Mackenzie River's boreal forest region. Recommendation is for the regional community and the resource management agency continued support for preseason banding within Mills Lake.

Photo: USFWS, Migratory Bird Management

Low water conditions at Mills Lake.

Whooping Crane Ecology and Rehabilitation

1 May 2014 – 1 September 2014

MAIN INVESTIGATOR:

Mark Bidwell, Species at Risk Biologist,
Canadian Wildlife Service

WILDLIFE RESEARCH PERMIT NUMBER:

WL500240

LOCATION:

Work is conducted within a 200 km radius of 60° 10' latitude, -113° 20' longitude. The nearest community is Fort Smith, NWT. Most whooping cranes breed within Wood Buffalo National Park (WBNP). However, there are several nests north of the Nyarling River outside the northern park boundary and two nests in Lobstick marsh, which is just east of the Little Buffalo River east of the park boundary. Data for this research were collected May 25-29 and August 9-13, 2014.

PARTNERS:

- United States Geological Survey
- United States Fish and Wildlife Service
- Crane Trust
- Platte River Recovery Implementation Program
- Parks Canada
- International Crane Foundation
- Gulf Coast Bird Observatory

CONTACT:

Mark Bidwell, Species at Risk Biologist
Canadian Wildlife Service
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Saskatoon, SK S7N 0X4

RATIONALE:

The *Whooping Crane Recovery Strategy* aims to protect, restore and manage whooping crane populations to be self-sustaining in the wild and to down list the species' status under Canada's *Species at Risk Act* (SARA) from Endangered to Threatened. A key component of the recovery is to monitor whooping crane breeding grounds in and around WBNP. Data collected during surveys are used to identify and update areas designated as critical habitat (CH) under *SARA* and to carry out other recovery activities. At present, the Aransas-Wood Buffalo (AWB) population of whooping cranes contains approximately 300 individuals. This is the only naturally occurring population of whooping cranes remaining in the world. Most breeding pairs nest inside WBNP, but the population has expanded its range outside the park and now includes up to seven pairs in the NWT. Due to the small population size, we are able to closely monitor breeding individuals, which allows considerable information on the population's demography. This is achieved annually by conducting (1) aerial surveys of breeding pairs and nests in May; (2) aerial surveys of fledging success in July/August; in some years (3) aerial surveys of hatching success are also conducted in June. This work has been conducted by the Canadian Wildlife Service (CWS) annually since 1966.

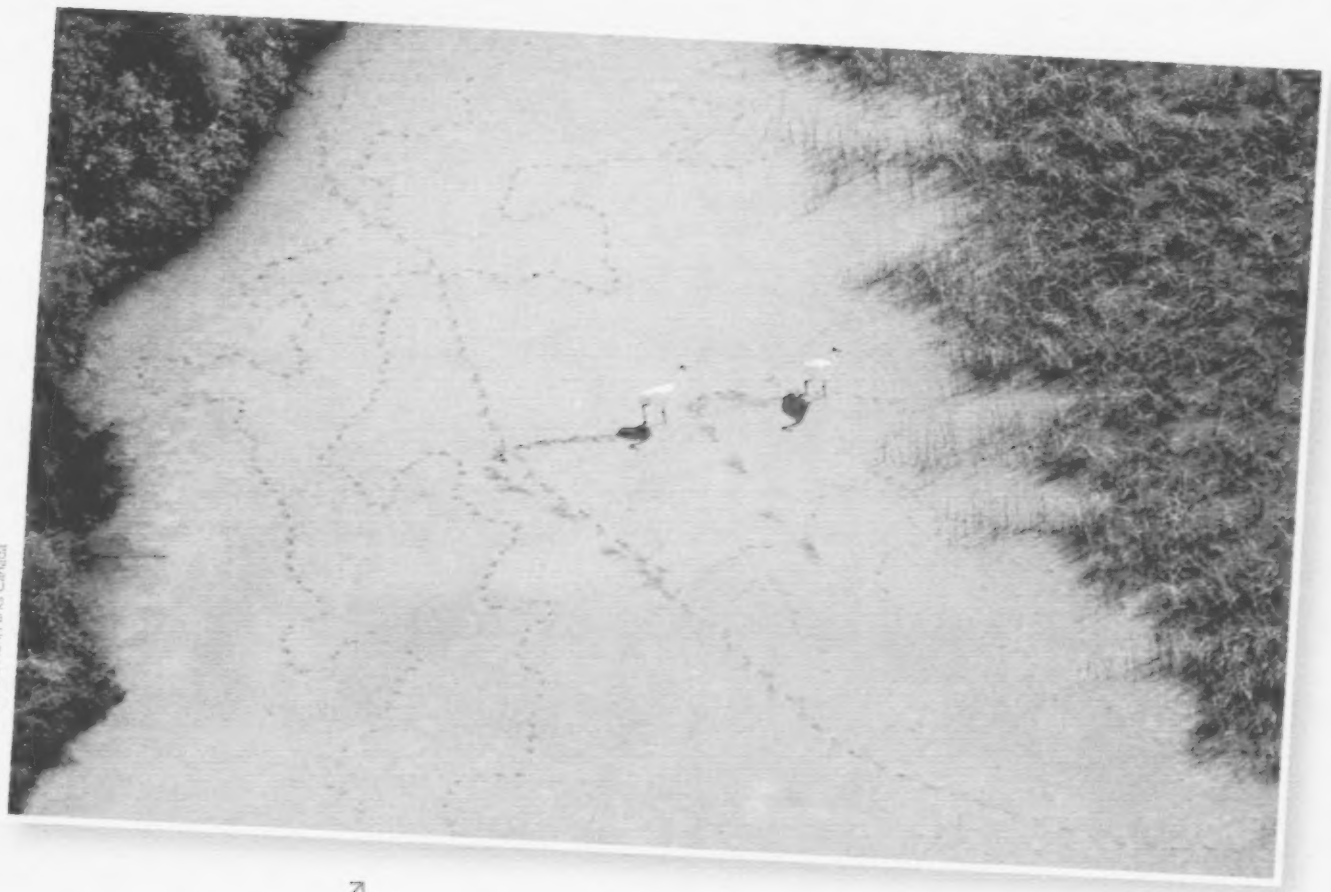

Photo: John David McKinnon, Parks Canada

Whooping crane pair in Wood Buffalo National Park

OBJECTIVES:

Population Monitoring: to monitor and understand the breeding ecology of whooping cranes in WBNP and the surrounding area. Datasets acquired during monitoring are used to identify and designate areas as CH under SARA and to estimate the relative abundance and productivity of breeding pairs annually.

METHODS:

Due to the inaccessibility of the whooping crane nesting area, aerial surveys are necessary to monitor breeding whooping cranes. In 2014, surveys to locate and count whooping crane breeding pairs in WBNP and surrounding areas were conducted between May 25-29 while surveys to locate fledged cranes were conducted August 9-13. Surveys were performed using a Eurocopter 120 Colibri helicopter piloted by Mark Rayner of Phoenix Heli-flight Inc.

RESULTS AND MAIN CONCLUSIONS:

During breeding pair surveys, 82 nesting pairs of whooping cranes were detected. The number of nests detected in 2014 is the highest count on record. In addition to nesting pairs, 17-21 territorial pairs were detected suggesting potential for substantial population expansion in upcoming years. Because cranes may move over the duration of the survey, this range reflects the possible number of unique pairs. Seven nests were found outside of WBNP; two in the Lobstick Creek area; and, five north of the Nyarling River. A single nesting pair was found in a previously undocumented nesting area in the Swampy Lakes regions approximately 24 km north of WBNP. This pair was identified through regular review of locations of whooping cranes fitted with satellite transmitters and represents the most northern whooping crane nest on record.

During fledging surveys, observers detected 32 fledged young in 30 family groups (two families included twins). The number of fledged young per nest was 0.39, lower than the 20-year average of 0.48 but within the long term natural range of variation.

LONG-TERM PLANS AND RECOMMENDATIONS:

It is very rare in wildlife ecology to be able to monitor an entire population and track individuals for extended periods of time. Due to the small size of the Wood Buffalo-Aransas whooping crane population, the birds' size and colour and their high degree of territoriality, it has been possible to monitor it with great detail, paying attention to population and individual attributes. This long term data has provided incredible insight to the populations' growth, obstacles and path to recovery.

Despite a healthy average annual growth rate of 4 percent, reaching the recovery goal of 1,000 birds in the wild is many years away. The long-term plans for this project are to continue monitoring breeding effort and chick production. We would like to relate these variables to habitat conditions and quality to better forecast future expansion of the breeding grounds and future impacts such as global warming and changes in water quality and quantity.

COMMUNITY INVOLVEMENT:

We received recommendations supporting our work from the Hay River Métis Government Council, Fort Providence Resource Management Board, Ka'a'gee Tu First Nation, Salt River First Nation (SRFN) and Smith's Landing First Nation. Some communities indicated a desire for local people to be hired when possible, however, the current research does not require seasonal staff at this time. Other community involvement included collaborations between CWS, SRFN and the ENR to place signs on the SRFN Treaty Land Entitlement Area in the vicinity of Lobstick Creek. The signs indicate whooping cranes nest in the area and provide advice to local land users on how to reduce their impact on cranes.

Wolverine DNA Survey at Daring Lake

1 April 2014 – 27 April 2014

MAIN INVESTIGATOR:

Robert Mulders, Wildlife Biologist Carnivore/ Furbearers, Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL500235

LOCATION:

Daring Lake, NWT (64.87°N, 111.59°W); northwest of Lac de Gras.

PARTNERS:

- Dominion Diamonds Ltd., Ekati
- Diavik Diamond Mines International
- DeBeers Canada – Gahcho Kué
- DeBeers Canada – Snap Lake
- John Boulanger, Integrated Ecological Research
- David Paetkau, Wildlife Genetics International

CONTACT:

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Environment and Natural Resources
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RATIONALE:

On the central barrens, human activities relating to mineral exploration and mining, and interest in expanding hunting opportunities have been increasing during the past 15 years. Communities, governments and wildlife monitoring agencies have expressed concern over the potential adverse cumulative effects on wolverine populations in terms of habitat loss, disturbance and increasing mortality. This concern was further highlighted as the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has assessed wolverine as a species of Special Concern. The NWT Species at Risk Committee will be assessing wolverine in 2015.

This DNA survey was conducted concurrently with three diamond companies (Dominion Diamonds Ltd., Ekati; Diavik Diamond Mines International, DeBeers Canada – Gahcho Kué and DeBeers Canada – Snap Lake) to obtain a more synchronized and robust assessment of the regional wolverine population.

OBJECTIVES:

- To obtain wolverine abundance and density estimates.
- To obtain demographic data on longer-term changes in the wolverine population.

METHODS:

A standardized sampling design was developed in collaboration with John Boulanger (Integrated Ecological Research) to ensure research methodologies and regional monitoring efforts are technically sound (Mulders et al 2007). This survey is carried out by snowmobile in April.

A total of 284 posts (4"x4"x5' in length) were set up within a systematic grid with a spacing of three km. Posts were wrapped in double stranded barbed wire, intended to snag single or small clumps of hair. Posts were baited with bison meat and lures. Each post was checked every ten days over a 20-day period, providing two separate snagging sessions. Collected hair was kept dry and sent to a genetics lab for DNA extraction and analysis, in order to identify individual wolverines.

RESULTS AND MAIN CONCLUSIONS:

Weather conditions were clear and cold in April, providing good travel conditions. However, we encountered less snow than observed in recent years across the 2,556 km^2 study area.

The two sampling sessions generated a total of 1,931 sample envelopes, containing primarily wolverine hair. These DNA samples will be analyzed by Wildlife Genetics International, with a final report expected in early 2015. The previous DNA survey at Daring Lake (April 2013) had identified 24 individual wolverines (14M, 10F), 12 of which were recaptures from earlier Daring Lake, Diavik and Ekati surveys. One of the females was initially detected in 2003 and during each survey since (spanning an 11-year period); another female has been consistently detected since 2004. Two males detected at Daring Lake were previously detected in 2012, within the Izok Lake study area 100 km to the NW of Daring Lake.

Since 2004, the Daring Lake survey data has identified a decline in the number and density of resident wolverines. The observed decline of over 60 percent, or about 11 percent per year, may be linked to the concurrent decline in Bathurst caribou – an important food item for wolverines on the central barrens.

LONG-TERM PLANS AND RECOMMENDATIONS:

In November 2013, ENR hosted a wildlife monitoring workshop, which included a review of wolverine monitoring efforts. Discussion included: how to address whether mine-related activities influence the relative abundance and distribution over time; approaches to addressing cumulative impacts; and, improving our understanding of wildlife ecosystems within the Slave Geological Province.

ENR released two technical reports in early 2014: a) Boulanger and Mulders (2013a) summarizes 2005-2011 Daring, Diavik and Ekati data; Boulanger and Mulders (2013b) is a comprehensive review of 2004-2011 Daring Lake data.

Plans for future surveys will be reviewed pending analysis of the 2013 and 2014 data, and further discussion with various partners about program objectives.

COMMUNITY INVOLVEMENT:

Field crew members were selected on the basis of their snowmobiling experience, ability to navigate on the central barrens, technical skills and willingness to work under challenging field conditions. Participants included David Giroux, Patrick Colin, Bruce Richardson, Daniel Drygeese, Archie Sangris and Patrick Goulet (hired through Det'on Cho Corporation); Yellowknife residents Ron Allen and Cory Gallant; Paul Woodard with Environment Canada; Ryan Gregory, Stefan Goodman and Tricia Fleming with the Land and Water Division; and, James Hodson and Robert Mulders with ENR's Wildlife Division.

Wolverine DNA Sampling on the Central Barrens

1 April 2014 – 15 May 2014

MAIN INVESTIGATOR:

David Wells, Superintendent Environment,
Diavik Diamond Mines (2012) Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500230

LOCATION:

The wolverine DNA program was conducted in the Diavik wildlife study area, centered around Lac de Gras, NWT. Similar programs, under separate wildlife research permits, were undertaken north of the area by the Ekati Diamond Mine, and west by the ENR.

PARTNERS:

- De Beers Canada Snap Lake Mine
- De Beers Canada Gahcho Kué Project
- Dominion Diamond Ekati Corporation
- Environment and Natural Resources
- Integrated Ecological Research (John Boulanger)
- Wildlife Genetics International (Dr. David Paetkau)

CONTACT:

David Wells, Superintendent Environment
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RATIONALE:

To monitor wolverine within the vicinity of the mine and the greater central barrens area.

OBJECTIVES:

To determine the relative abundance and distribution of wolverine over time within the study area.

METHODS:

The survey design was carried out by snowmobile in April 2014. Spruce posts (4"x4"x5' in length) were vertically set up within the study area in a systematic grid with a spacing of 3 km. Each post was wrapped in double stranded barbed wire, intended to snag small clumps of hair. Posts were baited with a small portion of meat and commercially prepared lures. Bison meat, deemed unfit for human consumption and provided by an ENR Renewable Resources Officer, was used for bait. Each post was checked on average every ten days over a 20-day period – providing two separate snagging sessions. Several remote cameras were set up to provide further insight into how wolverines and non-target species are using the posts.

Hairs were collected and sent to a genetics lab for DNA extraction and analysis.

RESULTS AND MAIN CONCLUSIONS:

A total of 925 hair samples were submitted to the genetics lab for DNA extraction. Results are still pending.

LONG-TERM PLANS AND RECOMMENDATIONS:

Diavik, along with our partners, will be reviewing this program to ensure it continuously improves and meets our stakeholder requirements.

COMMUNITY INVOLVEMENT:

Community members from the Yellowknives Dene First Nation and Kugluktuk, NU participated in the program.

Spruce posts set within the study area in a systematic grid with 3 km spacing.

Population Dynamics and Movements of Tundra Wolves Denning on Barren-ground Caribou Range in the Central Canadian Arctic

2013 – 2014

MAIN INVESTIGATORS:

Dean Cluff, Regional Biologist, Environment and Natural Resources, GNWT, North Slave Region; Michael Klaczek, MSc Candidate, University of Northern British Columbia; Chris Johnson, Associate Professor, University of Northern British Columbia

WILDLIFE RESEARCH PERMIT NUMBER:

WL500132

LOCATION:

We conducted our research within the summer range of the Bathurst caribou herd, an area encompassing approximately 71,000 km^2 in the NWT and Nunavut. The study area is situated in the Slave Geological Province and Southern Arctic Ecozone and includes Aylmer and Clinton-Colden Lakes to the east, Pellatt Lake and the northern tip of Contwoyto Lake to the north, Point Lake, Greenstockings Lake and Jolly Lake to the west, and Mackay and Walmsley Lakes to the south.

RATIONALE:

Wolves are the main predator of barren-ground caribou, however, the extent that they influence the decline and recovery of caribou populations is unknown. The *2011-2015 Barren-ground Caribou Management Strategy* for the Northwest Territories recommends further research to better understand the influence of predators on the population dynamics of barren-ground caribou. We are investigating wolf-caribou dynamics on the summer range of the Bathurst caribou herd. Wolf productivity may be limited by changes in the abundance or spatial distribution of caribou, where low caribou densities result in food shortages and high pup mortality. For wolves, newborn pups make up the largest age class in the pack, thus pup productivity and survival are important components in determining trends in wolf abundance.

OBJECTIVES:

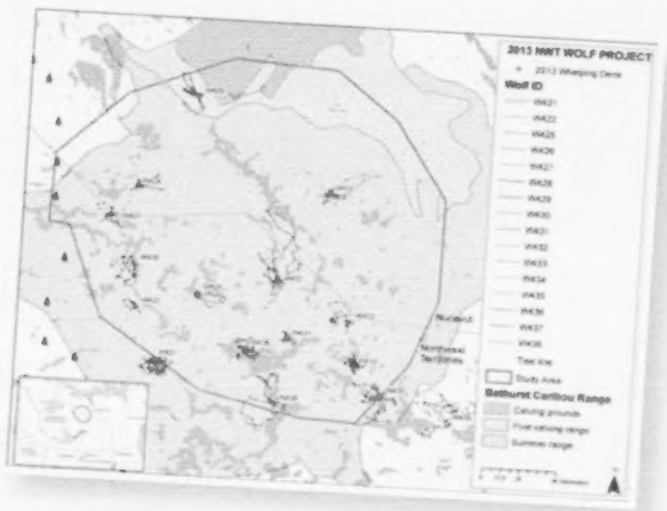
- To describe movement characteristics of tundra wolf packs to successive home sites (den and rendezvous sites) throughout the denning period.
- To document wolf pup recruitment at a time of low caribou abundance.
- To provide insight on the behavioral and numerical responses of wolves relative to changes in the distribution and abundance of caribou.

Wolf pup

Photo M. Klaczek, UNBC

Photo M. Klaczek, UNBC

Wolf pup, W438, north of Lac de Gras



Map GNWT/ENR

Wolf project study area

METHODS:

During late May-early June 2013, we surveyed previously known den sites on the Bathurst summer range to locate candidate wolves for collaring. Den sites were considered active if adults were observed. From June 21-24, we collared the breeding females at these active den sites. The breeding female was targeted for capture because of her role in pack dynamics and caring for pups throughout the denning period. Wolves were captured by helicopter net-gunning and chemically immobilized with an intramuscular injection of Telazol®. A blood sample was taken from each wolf to test for disease presence. GPS collars were programmed to obtain a location every 1.5 hours (16 locations per day) and are expected to function for 2¼ years (three summers and two winters). The wolf capture procedure was approved by ENR NWT Wildlife Care Committee. A Nunavut wildlife research permit for collaring and monitoring wolves was obtained for the Nunavut side of the study area.

Movement patterns revealed the locations of wolf home sites, duration of use and relocation to another home site. We conducted aerial and ground-based surveys at these sites in July, August and early September to monitor den occupancy, number of pups and pack size. The treeless tundra and extended daylight hours provided an opportunity to count pups from the air or from a distance on the ground. We started each session using a fix-winged aircraft (Aviat Husky) on floats to radio track collared wolves and land on small tundra lakes to access nearby den sites from the ground. Following our fix-winged surveys we based out of the Ekati™ and Diavik™ sites and benefitted from both their helicopter support and staff time to conduct follow-up ground-based surveys.

PARTNERS:

- Environment and Natural Resources (North Slave Region, and Headquarters) (ENR)
- Natural Resources and Environmental Studies Program, University of Northern British Columbia
- Dominion Diamond Ekati Corporation
- Diavik Diamond Mine Ltd.
- Cumulative Impacts Monitoring Program, Aboriginal Affairs and Northern Development Canada
- Northern Scientific Training Program, Canadian Polar Commission
- Natural Sciences and Engineering Research Council of Canada
- Wolf capture crew: B. Culling, D. Culling, D. Cluff, pilot Z. Dancevik
- Hoarfrost River Huskies, D. Olesen

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RESULTS AND MAIN CONCLUSIONS:

We captured 16 adult female wolves representing individual packs, 15 were breeding (lactating) females and one subadult (non-lactating) female. One wolf died inside of her den in July and we believe she starved and the pack lost their pups. Therefore, by the end of September, 15 out of the 16 wolves were still functioning and >24,000 wolf locations were recorded in total. Over three survey sessions in July, August and September we conducted over 103 aerial checks to track wolf packs by visiting known den sites, radio tracking or by visiting clusters of GPS locations that may have represented a relocated den or rendezvous site. We spent >65 hours observing wolf dens/rendezvous sites on the ground over 36 separate field visits. We collected over 90 scat samples at 14 den sites to analyze food habits of wolves during the denning period.

The captured subadult female dispersed out of the study area two weeks after capture and was excluded from further aerial monitoring. All GPS-collared breeding adult female wolves presented similar movement patterns in late June/early July, restricting their movements around their perspective den sites. We counted pups for 12 out of the 15 monitored packs, although we assumed that pups were

Photo: M. Klaczek, UNBC

Wolf pup at Misery esker.

present at all of these den sites at the time. Five of the GPS monitored packs lost their pups by the end of July and one pack lost their pups by the end of August. Only nine packs were observed with pups during our final survey of the denning period in September.

During the field season we opportunistically observed two more packs during survey flights in August and September, and recorded pack size and composition. The mean number of pups/den declined throughout the denning period from 2.9 (±0.23 SE) in July, 2.0 (±0.41 SE) in August, and 1.7 (±0.36 SE) in early September. The average pack size was 5.1 wolves. Pack structure typically consisted of a dominant male and female pair with usually one other adult or subadult present along with the pups. The largest pack size was nine wolves, however, only one of the five pups survived by the end of the denning period.

Only three packs remained at the same den site throughout the denning period (early September); thus entire litter loss accounted for half of the observed den site abandonment. The median date of den abandonment due to litter loss was 21 July. We recorded 32 home sites (den or rendezvous site) used by 15 packs during the denning period. Pups were relocated at least once, on average, and one pack (wolf 425) moved their pups to four different home sites between early July and early September. The median date for relocation was 23 July. On average, pups were moved 6.3 km to a new den or rendezvous site, however, one pack moved their pups over 17 km to a new den site in mid-July. Because of their dependence on caribou for food, preliminary results suggest the tundra wolf population is showing a corresponding numerical decline to lower caribou density.

LONG-TERM PLANS AND RECOMMENDATIONS:

Data collected during the upcoming 2014 denning season is expected to strengthen our findings to understand this wolf-caribou abundance relationship further. We are currently examining potential responses in habitat selection, den distribution and population dynamics of wolves relative to the considerable decline in population size of the Bathurst caribou herd. Quantifying the response of wolves to changes in Bathurst caribou abundance and distribution is the first step in understanding the role of wolves in the population dynamics of migratory caribou; providing key information to support management of the Bathurst herd.

COMMUNITY INVOLVEMENT:

Community representatives have provided advice during consultation meetings held at various communities.

Photo: M. Kaczek, UNBC

Adult wolf, W438, north of Lac de Gras

Mackenzie Wood Bison Population and Disease Studies

January 2014 – December 2014

MAIN INVESTIGATOR:

Terry Armstrong, Wildlife Biologist, Bison,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500267

LOCATION:

The study area was the Mackenzie wood bison population's range from the Mackenzie River at Fort Providence in the south to Behchokǫ in the north.

CONTACT:

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RATIONALE:

Population inventory information generally consists of data on distribution, abundance, age- and sex-composition, and condition and health of wildlife populations. These data comprise the basic information required for making inferences on population dynamics and form the basis for recommendations and decisions on wildlife management issues. These data also serve to track the response of a wildlife population to management actions, disturbances, and other ecological factors. These data provide the basis for adaptive management and evaluating effectiveness of management decisions. ENR conducts regular monitoring of the territory's bison populations.

After nearly 40 years of population growth, the Mackenzie wood bison population experienced a slow decline from the year 2000 to 2012, falling from approximately 2,000 animals to about 1,530 on late winter surveys. In the summer of 2012, anthrax killed at least 450 bison and by the late winter of 2013 ENR estimated approximately 700 animals in the population. In addition to anthrax, other typical mortality factors such as predation, winter weather and starvation along with collisions on NWT Highway 3 would have contributed to the decline. Population estimates are planned at regular intervals and annual surveys to estimate age- and sex-ratios provide data to help detect changes in herd composition and productivity.

Since anthrax can have dramatic effects on bison population size and can be transmitted to humans, ENR monitors for anthrax-caused bison mortality each summer. Suspicious bison deaths are investigated and, if anthrax is detected, the NWT's *Anthrax Emergency Response Plan* is implemented.

Bison management in the NWT is influenced by the presence of two infectious diseases originating from domestic livestock, bovine brucellosis (caused by *Brucella abortus*) and bovine tuberculosis (caused by *Mycobacterium bovis*). The Mackenzie population is currently free of those two diseases but there is an ongoing risk of their transmission from the nearby population in and around Wood Buffalo National Park. A bison free zone is maintained between the populations by the Bison Control Area program to reduce the risk of the diseases being transmitted to the Mackenzie and Nahanni bison populations. Monitoring for those diseases through tissue sampling contributes to an on-going assessment of the disease status of the population.

OBJECTIVES:

- To estimate calf, yearling and bull to cow ratios during the post-calving period.
- To monitor for the presences of brucellosis and tuberculosis in addition to other diseases and parasites.
- To monitor the population for the occurrence of anthrax-caused mortalities through the summer.

METHODS:

In late June or July, observers recorded sex and age information from a representative sample of the bison population. Observers are positioned near groups of bison by a helicopter which then herds the animals past so they can be classified as calves (young of the year), yearlings, cows (two years or older), juvenile bulls (B1 two to three years old), sub-adult bulls (B2, four to five years old) and mature bulls (B3, six years and older).

Monitoring for tuberculosis and brucellosis is done opportunistically when suspect cases are reported to ENR staff and from bison killed in collisions, shot by hunters, or removed from the community by ENR staff.

In coordination with the composition survey, we also conduct biweekly fixed-wing flights over parts of the range used by bison in the summer to search for bison that may have died of anthrax.

Composition survey flight over the summer bison range with active forest fires.

Photo GNWT/T Armstrong ENR

RESULTS AND MAIN CONCLUSIONS:

We were unable to complete a survey to estimate age- and sex-ratios in 2014 because of extensive forest fires in the range. Smoke and active fires reduced visibility and access over much of the traditional bison summer areas so the sample of animals classified was too small to generate meaningful ratios.

No anthrax-killed bison were found in 2014. Surveillance flights were also curtailed due to fire and poor visibility due to smoke, but they were offset by fire-related air traffic in the area. No suspect cases of disease were reported or detected among road-killed or culled bison.

LONG-TERM PLANS AND RECOMMENDATIONS:

We plan to continue monitoring this population's size at regular intervals – the next population estimate is scheduled for late winter 2016 – and herd composition annually. We also plan to continue annual surveillance efforts for anthrax and to monitor for brucellosis and tuberculosis.

Photo: GNWT/K. Cox, ENR

Active forest fires in the bison range.

Forest fires over the traditional bison summer area

Photo GNWT/K. Cox ENR

Mackenzie Wood Bison Population Monitoring

27 February 2013 – 27 February 2014

MAIN INVESTIGATOR:

Terry Armstrong, Wildlife Biologist, Bison,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500112

LOCATION:

Fort Providence and Behchokǫ areas, NWT.

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RATIONALE:

The Mackenzie wood bison population suffered a major population decline due to a severe anthrax outbreak in 2012. It is also an important population for the conservation and recovery of wood bison due to its bovine brucellosis- and tuberculosis-free status. This project is designed to monitor the population's size, indicators of calving success, health status and to survey for potential anthrax cases.

OBJECTIVES:

- To measure calf, yearling, and bull to cow ratios during the post-calving period.
- To monitor the Mackenzie bison population for the presence of brucellosis and tuberculosis in addition to other diseases and parasites.
- To monitor the Mackenzie herd for the occurrence of anthrax related mortalities in summer.
- To conduct a census of the Mackenzie bison population.

METHODS:

Counted the number of calves, yearlings, cows and bulls in parts of the population's range in July, 2013.

Collected samples from problem bison removed from the community to monitor for diseases.

When possible, we also took samples from bison killed in motor-vehicle collisions.

Monitored the population for potential anthrax mortalities during four flights over main bison areas during the summer of 2013.

Conducted an aerial survey in March 2013, to estimate the number of bison remaining in the population following the 2012 anthrax outbreak.

RESULTS AND MAIN CONCLUSIONS:

There was very low calf production in the Mackenzie population in 2013, but reasons for that are unknown.

There was no indication of brucellosis or tuberculosis from the animals sampled.

We found one dead bison in July, 2013, but it tested negative for anthrax and we found no other potential anthrax mortalities.

We estimated approximately 700 bison in the Mackenzie population in March 2013, down from 1,500 a year earlier. The main cause of the decrease was the 2012 anthrax outbreak but motor-vehicle collisions also killed a significant number of bison in 2013. Predation and other normal mortality factors, e.g. winter conditions also would have affected the population.

LONG-TERM PLANS AND RECOMMENDATIONS:

We plan to continue to monitor the population for potential anthrax outbreaks annually, as well as for the presence of brucellosis and tuberculosis. We will also monitor calf production annually if possible. We recommend another estimate of population size be made in March 2017.

COMMUNITY INVOLVEMENT:

We hired observers from Fort Providence during the population survey.

Photo: GNWT/K. Cox, ENR

Mackenzie wood bison composition survey.

Monitoring of the Nahanni Wood Bison Population

June 2013 – June 2014

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL005040

LOCATION:

This is an ongoing study monitoring baseline population demography and disease presence of the Nahanni wood bison population. The study was initiated in 2002. The population ranges over NE British Columbia (BC), SE Yukon Territory and the SW NWT with the majority of the range in SW NWT along and adjacent to the Liard and lower reaches of the South Nahanni and Kotaneelee River Valleys.

PARTNERS:

- Environment and Natural Resources
- British Columbia Provincial Government
- Acho Dene Koe Band
- Nahanni Butte Dene Band

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RATIONALE:

The Nahanni wood bison population was initially established with a transplant of 21 bison to the area in June of 1980. An aerial population survey in March 2004 estimated 400 bison. A survey in March 2011 estimated 413 bison indicating limited population growth. A limited number of animals outfitted with satellite and GPS collars from 2007-2011 showed that the population was distributed over a much larger area than had been considered and demonstrated the need for a sightability correction factor in order to interpret the results of aerial surveys properly. Future population surveys will be required, preferably at ≤5 year frequency, and there will be a need for a number of collared animals when surveys are to be conducted.

The Nahanni population is currently afforded a measure of protection against infection with *Brucella abortus* (causes brucellosis) and *Mycobacterium bovis* (causes tuberculosis) by maintaining a bison free zone to prevent contact with infected bison from Wood Buffalo National Park. Monitoring for these diseases through blood sample collections provide a measure of the effectiveness of the bison control program in addition to the assessment of disease status of the Nahanni bison population.

Photo: GNWT/D Allaire, ENR

Bison observed during a boat survey along the Liard and South Nahanni Rivers

Photo: GNWT/N. Lanter ENR

Nahanni wood bison

Annual composition surveys provide data on calf production, juvenile overwinter survival and the ratio of breeding age males to females. These data are useful for evaluating the impact of selective hunting, herd productivity, causes of death, predation on calves and population survey estimates. Population surveys were conducted in March 2004 and March 2011 and are planned to be conducted on a five to six year cycle.

During 2007-2011 GPS and satellite collars were deployed on male and female bison to better identify animal movements, the frequency of river crossings, population range, seasonal range and animals frequenting communities, and to assess animal sightability in relation to aerial surveys. Few collars remained functioning for more than 24 months. We also continue to assess different measures to mitigate bison presence in communities and any perceived threats to human safety.

OBJECTIVES:

- To measure calf, yearling, and bull:cow ratios during the post-calving period.
- To monitor annual calf production and estimate over-winter survival of calf bison.
- To collect biological samples as and when available from harvested animals or those involved in motor vehicle collisions.
- To document seasonal movement patterns and range use of male and female bison throughout the range, delineate the area used by the population and document animal movement into new areas of the range.
- To document the frequency of river crossings by collared wood bison.
- To identify and monitor the presence, movements, and behaviour of bison in communities.
- To provide empirical data for the community bison working groups and for use in drafting a management plan for the Nahanni wood bison population.
- To monitor the Nahanni wood bison population for the presence of brucellosis and tuberculosis.

METHODS:

In mid-July we conduct a boat-based survey of bison along the Liard and South Nahanni Rivers from the BC border to Blackstone.

Bison are classified as calves, yearlings, cows, juvenile bulls, subadult bulls and mature bulls.

ENR and biologists from Government of British Columbia participate in this survey. ENR staff reciprocated by assisting BC biologists with their survey of the Nordquist wood bison population.

Location data from collared animals are processed and received daily. Data are entered into a database and used for GIS analyses. Data are being shared with a graduate student for an RSF modelling exercise as part of her thesis.

Location data were mapped on a biweekly basis until the collars ceased to transmit.

Biological samples were collected from the one harvested bison.

RESULTS AND MAIN CONCLUSIONS:

165 bison were classified in July 2013. Only in two of the past 11 years did we classify more bison on the annual river survey.

The number of calves and yearlings/100 females and overwinter survival estimates were calculated, the latter using both July 2012 and 2013 classification results.

The estimated 46 calves/100 females were slightly above average.

We estimated the highest number of yearlings/100 females from any survey at 37.

Overwinter survival of calves was estimated at 65 percent, the highest estimated since the study started, reinforcing a strong yearling cohort for 2013.

Poster-sized maps of the survey results and a brief report of the results were circulated to Acho Dene Koe Band and the Nahanni Butte Dene Band.

One bison was harvested under quota; some biological samples were provided.

The last two functioning collars on females stopped transmitting during the winter.

Photo: GNWT/D.Allaire, ENR

Annual community meeting discussing wood bison survey results.

LONG-TERM PLANS AND RECOMMENDATIONS:

With the Mackenzie herd suffering a serious recent decline in numbers it is critical that annual monitoring of population demography of the Nahanni population continues, and a population survey is conducted sooner than later to help the recovery efforts of bison in the NWT. Replacement collars will need to be deployed prior to the next population survey to establish an appropriate survey area and sightability correction factor. Another aerial survey to estimate the population should be conducted by March 2016 at the latest. We should continue our collaboration with Yukon and BC government biologists on population monitoring and annual sex/age classification surveys for this population. There should be interjurisdictional participation and collaboration in similar surveys of the two northeastern BC populations.

Location data will be used to assess seasonal range use and assist in delineating areas of high use in the range. Location data from the original collars should undergo RSF modeling analysis. Bison certainly use linear features for moving throughout the range. Additional collars deployed prior to the next survey should provide additional information on range use and distribution of the population. Bison have recently been frequenting areas further west in the mountains. Collared animals will assist in monitoring animals frequenting communities. We will continue to work with communities to mitigate bison presence and to develop a Nahanni population management plan with local communities as part *NWT Wood Bison Management Strategy*. Continued monitoring for disease and the collection of biological samples from hunter-killed, darted or deceased animals should continue as the opportunities arise.

Photo: GNWT/D Allaire ENR

Community members and ENR staff classifying wood bison

COMMUNITY INVOLVEMENT:

The project was initiated based upon community requests from Fort Liard and Nahanni Butte. Local residents have participated as river guides for surveys and as observers in all population surveys. Local residents are hired to assist with the collection of biological samples and distribution of meat from animals euthanized in or near communities. At annual community meetings and biennial Regional Wildlife Workshops, the program is evaluated and critiqued by local First Nations and program comments are discussed and addressed. As part of the *NWT Wood Bison Management Strategy*, bison working groups have been established in Nahanni Butte and Fort Liard. We continue to have community meetings with these groups twice a year and to work toward drafting a *Nahanni Wood Bison Management Plan*.

Slave River Lowlands Bison Population Studies

27 February 2013 – 27 February 2014

MAIN INVESTIGATOR:

Terry Armstrong, Wildlife Biologist, Bison,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500154

LOCATION:

Slave River Lowlands – Fort Smith and
Fort Resolution areas.

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RATIONALE:

It is useful for bison conservation and management to estimate the number of bison in the Slave River Lowlands (SRL) and to monitor a measure of productivity – the calf:cow ratio. We also conduct annual surveillance to detect cases of anthrax in bison in the SRL.

OBJECTIVES:

- To measure calf, yearling and bull to cow ratios during the post-calving period.
- To monitor SRL bison for the occurrence of anthrax related mortalities in summer.
- To conduct a census of the SRL bison population.

METHODS:

We were unable to determine the number of calves, yearlings, cows and bulls in parts of the population's range in the summer of 2013 because aircraft resources were unavailable due to forest fires.

Monitored the population for potential anthrax mortalities during flights over main bison areas during the summer of 2013.

Conducted an aerial survey in February 2014.

RESULTS AND MAIN CONCLUSIONS:

No dead bison were found in the SRL in the summer of 2013.

We estimated approximately 1,100 bison in the SRL in February 2014, down from over 1,700 in 2009.

LONG-TERM PLANS AND RECOMMENDATIONS:

We plan to continue to monitor the population for potential anthrax outbreaks annually. We will also monitor calf production annually if possible. We recommend another estimate of population size be made in March 2018.

COMMUNITY INVOVLEMENT:

We hired observers from Fort Smith during the population survey.

Wood bison observed during composition survey in the Slave River Lowlands.

Photo GNWT/T Armstrong ENR

Bison Control Area Program – 2012-2013

December 2012 – April 2013

MAIN INVESTIGATOR:

Karl Cox, Wildlife Technician,
Environment and Natural Resources,
GNWT, South Slave Region

WILDLIFE RESEARCH PERMITS NUMBERS:

WL004825 (1 January 2012 – 31 December 2012);
WL500102 (31 January, 2013 – 31 January, 2014)

LOCATION:

The Bison Control Area (BCA) is located between the NWT/Alberta border and the Mackenzie River and Great Slave Lake. It is bounded on the east by the Buffalo River and Wood Buffalo National Park (WBNP) and on the west by the Trout River and 121° longitude.

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RATIONALE:

Bison in WBNP and the Slave River Lowlands are infected with bovine tuberculosis and brucellosis while both the Nahanni and Mackenzie bison populations are free of these livestock diseases. To help protect the disease-free status of these two populations, the GNWT implemented the BCA program in 1987. The objective of this program is to reduce probability of disease transmission between herds by preventing bison from moving through, or establishing herds, within the area south of the Mackenzie River between the Trout and Buffalo Rivers. The program is cost-shared with WBNP.

OBJECTIVES:

The goal of the Bison Control Program in the NWT is to reduce the risk of infection of the Mackenzie and Nahanni-Liard herds with tuberculosis and brucellosis. Objectives of the program are:

- To continue surveillance of the BCA.
- To maintain the BCA free of bison and prevent the establishment of any herds within its boundaries.
- To increase public awareness of the Bison Control Program.

METHODS:

The BCA is stratified into three zones. Zone I is the area in which bison are most likely to be seen, since it is the section of the BCA that is nearest to both the Mackenzie Bison Sanctuary and WBNP. Therefore, the program focuses on this particular zone, with frequent aerial surveillance in the form of weekly shoreline patrols. Zone II is a larger zone and is surveyed twice a year during semi-comprehensive and comprehensive aerial surveys. Personnel include a pilot and one observer for shoreline patrols, and a pilot, navigator, and two observers for the semi-comprehensive and comprehensive surveys. Surveillance of Zone III relies on reports from people living and travelling in the area instead of aerial surveys.

Aerial surveillance is conducted during the winter months when bison and signs of their presence (feeding craters and tracks) are most visible. Also, the probability of bison moving through the BCA is the greatest in the winter because we assume bison are more likely to walk across the frozen Mackenzie River than swim across it in the summer.

Public awareness of the BCA is promoted with the use of newspaper and radio advertisements in areas affected by the BCA. There are also signs placed where the highways cross the BCA boundaries.

RESULTS AND MAIN CONCLUSIONS:

During the 2012/2013 season, there were three reports of bison either entering or approaching the BCA. All three reports involved bison leaving the north side of the Mackenzie River. Each report was investigated and no action was required. Twelve shoreline patrols, a semi-comprehensive (February) and comprehensive (March) survey were flown from January to April, 2013. The aerial surveys were completed in 92.7 hours over 22 days.

LONG-TERM PLANS AND RECOMMENDATIONS:

This program is ongoing. It is recommended the BCA program continue until such time as the risk of disease transmission no longer exists or a better method of reducing that risk is discovered.

COMMUNITY INVOLVEMENT:

Local observers participate in aerial surveys. Throughout the history of the BCA, community members have proven to be extremely valuable as the majority of occurrences of bison in the BCA have been reported by community members.

Wildlife Health, Condition and Genetic Monitoring

1 January 2014 – 31 December 2014

MAIN INVESTIGATORS:

Brett Elkin and Iga Stasiak, Wildlife Veterinarians, Environment and Natural Resources, GNWT

WILDLIFE RESEARCH PERMIT NUMBER:

WL500199

LOCATION:

NWT-wide.

PARTNERS:

- Local hunters and trappers
- Members of the general public
- Environment and Natural Resources (ENR) biologists and Renewable Resource Officers
- Canadian Wildlife Health Cooperative
- Canadian Food Inspection Agency
- Centre for Coastal Health
- University of Saskatchewan Western College of Veterinary Medicine
- University of Calgary Faculty of Veterinary Medicine
- Wildlife co-management partners

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RATIONALE:

Although most wild animals are healthy, diseases and parasites do occur in all wildlife populations. Some diseases and parasites are naturally occurring and appear to cause little problem in their host while others have the potential to impact wildlife at both the individual animal and population level. Some of these diseases and parasites can also affect people and domestic animals.

Samples from animals harvested by hunters and trappers, found sick or dead, or handled during wildlife research or management activities by ENR staff, other wildlife agencies or university researchers can provide valuable health, condition, stress and genetic information on wildlife populations. These samples provide an opportunity to monitor diseases and contaminants of particular importance to wildlife and human health and to identify new and emerging diseases. Taking advantage of samples from these existing activities provides additional valuable information for making wildlife management decision and providing public information.

OBJECTIVES:

- To determine the cause of sick or dead wildlife found, harvested or handled by hunters, trappers, biologists, wildlife researchers, Renewable Resource Officers, or the general public.
- To assist hunters and trappers by testing samples from harvested wildlife to determine what diseases or parasites are present, and the implications for their use or consumption.
- To work co-operatively with hunters, trappers, Renewable Resource Officers, biologists, researchers, wildlife managers and members of the general public to monitor the health and condition of wildlife on an ongoing basis.
- To identify the types, relative levels and geographical distribution of diseases, parasites and contaminants found in wildlife across the NWT.
- To monitor the overall health, condition, and stress in wildlife across the NWT.
- To collect genetic information that will contribute to the understanding and management of wildlife populations.
- To increase public awareness of wildlife diseases and parasites, contaminants and wildlife health and condition.

METHODS:

Samples are collected in several different ways:

- Local hunters, trappers and Renewable Resource Officers frequently submit samples from harvested wildlife.
- Members of the general public, wildlife biologists or Renewable Resource Officers may also submit samples from wildlife that are sick or found dead.
- Samples from animals handled during wildlife research or management activities may be submitted by biologists, technicians, other wildlife researchers or Renewable Resource Officers.
- Whole animals or samples of the affected tissues or body parts are collected, as well as other samples necessary to determine health status, body condition and age.

Samples are analysed for diseases, parasites, contaminants, body condition, pregnancy, stress, and/or genetics. Results are provided to the individual who submitted the sample, and recorded in an NWT disease database to monitor disease trends across the NWT and over time.

RESULTS AND MAIN CONCLUSIONS:

Samples submitted for disease surveillance:

- Hunter submitted samples (field and lab tested): 155.
- Anthrax surveillance in Mackenzie Bison Sanctuary and Slave River Lowlands June through August (no cases or outbreaks detected).
- Testing suspect anthrax cases (no positive cases).
- Barren-ground caribou health and condition surveillance: Bathurst, Beverly and Ahiak, Bluenose-East (128 tested).
- Brucellosis and tuberculosis surveillance in wood bison.
- CWD surveillance: caribou.
- Echinococcus and other gastrointestinal parasite surveillance: wolves and wolverine (172 tested).
- Erysipelas monitoring in Banks Island muskox (100 tested).
- National Avian Influenza Surveillance - birds (not detected).
- National West Nile Virus - birds and mosquitoes (not detected).
- Rabies surveillance (188 tested; 6 positive cases).
- Trichinella surveillance – multiple species (156 tested).
- Contaminant testing in caribou, Dall's sheep, mountain goats, sheep and moose (81 tested).

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife disease surveillance is ongoing every year.

Long-term testing will continue on any hunter submitted samples, animals found dead, and the investigation of disease cases or outbreaks. Results of this testing will be used to provide information and recommendations to the Department, individual harvesters, the public, and wildlife management agencies and wildlife co-management boards.

COMMUNITY INVOVLEMENT:

Hunters and trappers frequently bring in samples or provide reports of diseases, parasites or abnormalities in harvested wildlife. Identification of the diseases or parasites involved in these cases can be important to make decisions on consumption of meat from the affected animal. Sick or dead animals are also found periodically in the wild and testing is required to determine the cause of death and potential significance for other wildlife, domestic animals and people. Information and samples provided by hunters, trappers, biologists, Renewable Resource Officers and the general public on diseases and parasites can also be used to identify important wildlife health issues and areas requiring further monitoring or testing.

Photo: GNWT/N. Larter, ENR

Taking samples from a bison head for testing.

Community-based Monitoring of Wildlife Health Phase 2: Stress and Pathogens in a Changing Landscape

20 March 2013 – 20 March 2014

MAIN INVESTIGATORS:

Susan Kutz,
Associate Professor of Ecosystem and Public Health;
Anja Carlsson, Postdoctoral Fellow,
University of Calgary;
Richard Popko, Manager Research and Monitoring,
Environment and Natural Resources,
GNWT, Sahtú Region

WILDLIFE RESEARCH PERMIT NUMBER:

WL500125

LOCATION:

Sahtú Settlement Region.

PARTNERS:

- Environment and Natural Resources (ENR)
- Sahtú Renewable Resource Councils (SRRC)
- Sahtú Renewable Resources Board (SRRB)
- Additional funding from Cumulative Impact Monitoring Program, Liber Ero Fellowship, and the Natural Sciences and Engineering Research Council.

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RATIONALE:

The Sahtú is currently undergoing unprecedented landscape change associated with increasing industrial activities. These disturbances are predicted to have significant effects on the health and sustainability of caribou and moose. Despite the importance of these species to Aboriginal communities and ecosystem integrity there is still a lack of baseline health indexes for caribou and moose. This program began in 2003 in response to community concerns about wildlife health under a regime of rapid environmental change (climate and industrial development) in the Sahtú Settlement region, NWT. Community members indicated that they had concerns about the health and sustainability of wildlife, how wildlife health and disease may affect them, and that the next generation (youth) may not be adequately prepared to take on the emerging environmental issues in the region. Together with ENR, the SRRB and the SRRC, the University of Calgary has run the wildlife health monitoring program in order to address these concerns.

Photo: Anja Carlsson, University of Calgary

Anja Carlsson and wildlife health monitor Jeffery Jackson at the ENR office in Norman Wells.

Photo: GNWT/R. Popko, ENR

Michael Etchinelle searching for caribou.

OBJECTIVES:

- To provide baselines on body condition, body size, age, stress and disease for caribou and moose of the Sahtú Settlement Area.
- To maintain an on-going community-based wildlife health monitoring program.
- To share knowledge about wildlife health.

METHODS:

The program documents what is present for pathogen biodiversity and abundance (measured by prevalence and intensity) and other health indices (body condition, body size, age and stress) to provide a baseline for detecting changes in the future. In 2013 the project expanded to include woodland caribou as well as measures of stress in fecal and hair samples. We work with communities to establish these health baselines. Local subsistence hunters are trained to collect data using standardized sampling protocols and pre-prepared sampling kits. Samples collected include the lower jaw, the left metatarsal, fecal sample, the left kidney with fat, a piece of the liver, blood on filter papers and a piece of hide. Samples are collected and processed according to standardized protocols developed by the CircumArctic Rangifer Monitoring and Assessment Network (Kutz et al. 2013). Blood was tested for *Neospora caninum* and a variety of bovine viruses. Fecal samples were sent off to measure glucocorticoid levels according to standardized methods (Ashley et al. 2011).

Photo: Anja Carlsson, University of Calgary

Blood samples on filter-papers drying in the sun.

RESULTS AND MAIN CONCLUSIONS:

In 2013 and 2014, 36 samples were collected from the Bluenose-East caribou herd, 16 from the Bluenose-West caribou herd, 40 from mountain caribou and 18 from moose. The preliminary findings from this year include:

- The first time samples from mountain caribou in the Sahtú were collected.
- Samples from the Sahtú were tested for glucocorticoid (stress hormone) levels for the first time. Fecal samples from 2013 have been analyzed. The mean levels of fecal cortisol and corticosterone (ng/g wet feces), respectively, were: for barren-ground caribou, 18.65 and 57.66 (n=7); woodland caribou 13.65 and 32.11 (n=21); and moose 17.68 and 77.72 (n=12). As found in other studies, corticosterone metabolites are consistently detected in a higher level than cortisol. Corticosterone levels were within a similar range as those reported in captive reindeer (Ashley et al. 2011). These results are a first step in understanding the level and variation of GC hormones in feces, and are crucial for establishing a baseline of stress levels in a changing environment.
- Mountain caribou sampled in 2013 have antibodies reacting to *N. caninum*, bovine herpesvirus-1 (BHV-1) and bovine viral diarrhea virus (BVDV), suggesting that these, or related pathogens are circulating in the region. Of the mountain caribou sampled, 13 percent (3/23) were seropositive for *Neospora*, 43.5 percent (10/23) were positive for BHV-1 and 50 percent (4/8) were positive for BVDV. This is the first time mountain caribou in the Sahtú have been tested, and the first time that *Neospora* antibodies have been detected in caribou in the Sahtú. Consistent with other results on Bluenose caribou herds (Curry 2013), there was no evidence of *Neospora* infection in barren-ground caribou (n=9). *N. caninum* is a protozoan parasite and the suspected cause of an abortion storm in captive reindeer (Kutz et al. unpublished data). It is probable that *N. caninum* can have reproductive impacts on wild northern ungulates, which could lead to reductions in productivity.

Photo: Anja Carlsson, University of Calgary

Making dry meat at Caribou Flats.

- Surprisingly, none of the moose sampled in 2013 were seropositive for *Neospora* (0/12), which is in contrast to previous years where a 36.3 percent (5/19) were seropositive. Samples collected in 2014 are still being processed and analyzed.

LONG-TERM PLANS AND RECOMMENDATIONS:

Some key recommendations for the future of the program:

- Continued monitoring of mountain caribou.
- Continuing to monitor diseases that can have significant impact on the health and viability of herds, including *N. caninum*, *Toxoplasma gondii*, pestiviruses, cervid herpes viruses and the winter tick.
- Continue sample collection and analysis of glucocorticoid levels in hair and feces.
- Samples should be received by a dedicated agency/person that ensures data quality on reception.
- Data should be stored long term within the GNWT databases.
- For long-term success, the program should be run by a local agency, with local capacity for training and sample processing.

COMMUNITY INVOLVEMENT:

Exchange of knowledge and participatory research are critical components of our research program where community members, the key stakeholders, are active and meaningful members in our research team. We work closely with ENR, SRRB, SRRCs as well as community members and hold annual meetings and disseminate our results to stakeholders on a regular basis. Community members have clearly voiced their concerns regarding the impact of development. We are responding directly to these concerns, first by directly targeting communities along the Mackenzie valley, and second by incorporating stress as a health measure.

Photo: Anja Carlsson, University of Calgary

Rodick Yallee, Ronald Beyennie, and Michael Etchinelle butchering a caribou during the Tulita fall harvest at Caribou Flats.

Chemical Management Plan National Wildlife Monitoring Program – Great Slave Lake

June 2014

MAIN INVESTIGATOR:

Pamela Martin, Wildlife and Landscape Science Directorate, Environment Canada

WILDLIFE RESEARCH PERMIT NUMBER:

WL500250

LOCATION:

North Arm of Great Slave Lake, June 2014.

PARTNER:

- Canadian Wildlife Service, Environment Canada

CONTACT:

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Map: Canadian Wildlife Service

Herring gull egg collection sites in North Arm, Great Slave Lake.

RATIONALE:

Environment Canada's *Chemicals Management Plan* (CMP) has funded a national monitoring program to track the occurrence of emerging and priority chemical compounds in all components of the environment, including wildlife. As part of this program, herring gull eggs will be collected across Canada, including a location on the North Arm of Great Slave Lake to provide this information for the western Arctic. Eggs will undergo toxicology analysis for flame retardants and other chemicals of concern. Monitoring of chemicals is expected to continue for several years to assess changes in chemical occurrence over time.

Herring gulls and other similar gull species have been used as the typical sentinel species for contaminants in aquatic environments for over 30 years. They are used because they are known to accumulate organic contaminants, nest in colonies making egg collection relatively simple, and lay three eggs but seldom rear more than two chicks, thus the removal of a single egg from a nest does not typically reduce breeding success.

OBJECTIVE:

- To assess the toxicological characteristics of local water birds in relation to national data.

METHODS:

Gull nesting colonies on the North Arm of Great Slave Lake were visited by boat on June 14 to collect herring gull eggs. The field crew landed on the nesting islands. Egg collections were completed in a short amount of time with minimal disturbance and researchers leave the colony quickly. A total of 15 eggs were collected in 2014, one egg from each nest.

The eggs were shipped in a padded box to Environment Canada's National Wildlife Research Centre in Ottawa, ON for contaminants analysis. Contaminant levels will be compared to other samples collected across the country.

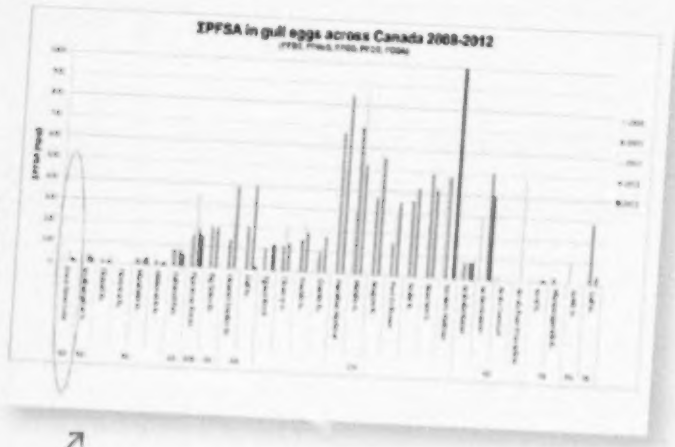

Chart: Canadian Wildlife Service

Sum PFCs in gull eggs across Canada, collected 2008-2012.

RESULTS AND MAIN CONCLUSIONS:

Eggs collected in 2014 have not yet been analyzed. However analysis of eggs collected in previous years (2008-2012; no eggs were collected from Great Slave Lake in 2013) show that levels of flame retardants (BDEs) and PFCs (chemicals like Scotchguard™ fabric protector) were similar to those found in island colonies on the Atlantic and Pacific coasts of Canada but were only a fraction of those found in gulls from the Great Lakes, St. Lawrence and prairie areas.

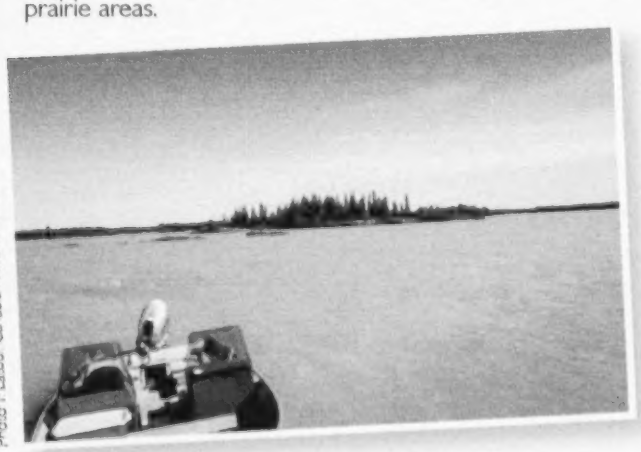

Photo: P. Latour, Canadian Wildlife Service

LONG-TERM PLANS AND RECOMMENDATIONS:

Monitoring of chemicals is expected to continue for several years in order to assess changes in chemical occurrence over time at locations across Canada. As results are obtained, fact sheets will be updated to share with communities and other stakeholders.

COMMUNITY INVOLVEMENT:

We thank Moise Rabesca from Behchokǫ for providing boating and guiding services.

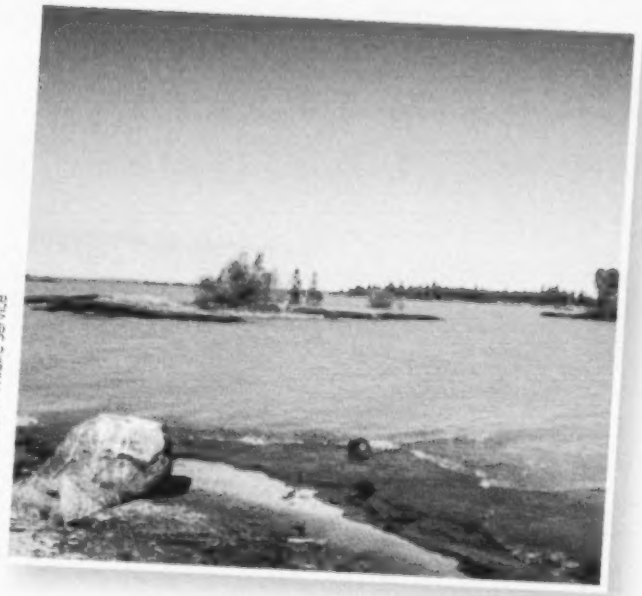

Photo: P. Latour, Canadian Wildlife Service

Herring gull nesting islands in North Arm, Great Slave Lake.

Selwyn Project Baseline Studies

1 January 2014 – 1 January 2015

MAIN INVESTIGATOR:

Selwyn Chihong Mining Ltd.

WILDLIFE RESEARCH PERMIT NUMBERS:

WL500223, WL500115

LOCATION:

All wildlife studies took place within the project area and area adjacent to the Howard Pass Access Road (HPAR) an existing 80 km gravel surfaced road that commences at km 188 of the Nahanni Range Road, north of the Cantung Mine to the NWT/Yukon border at Howards Pass.

PARTNERS:

- Selwyn Chihong Mining Limited (SCML)
- Madrone Environmental Services Limited
- Richard Farnell – Wildlife Biologist

CONTACTS:

Doug Reeve,
Manager Permitting and Regulatory Affairs
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Tania Tripp, Biologist
Madrone Environmental Services Ltd.
1081 Canada Avenue
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RATIONALE:

The data will be used to describe the local environment to support the environmental assessment process.

OBJECTIVES:

- To support permit applications and the environmental review process.
- To predict and mitigate effects to the environment and wildlife that may result from project development.
- To provide pre-development information in support of any future environmental affects monitoring program.
- To contribute to regional studies for assessing and managing potential cumulative effects.

METHODS:

A late-winter ungulate (moose and caribou) survey was flown on 15 March 2014. A summer caribou post-calving survey was flown on 14 and 15 July 2014. A range-wide caribou rut count survey was flown on 30 September and 2 October 2014.

Photo: Doug Reeve, Selwyn Chihong Mining

Selwyn Chihong Mine surround area

RESULTS AND MAIN CONCLUSIONS:

Limited interaction with moose and caribou relative to the HPAR was observed during the late-winter period. More comprehensive results from the 2012 through 2014 field work are presented in the annual wildlife monitoring report available from SCML. The post-calving survey found 675 caribou and supplemented seven years of baseline conditions analysis of the project area and two control areas to assess project effects on caribou distribution dynamics. The range-wide rut count survey found a sample of 431 caribou to provide additional data for evaluating Nahanni caribou herd population trend and better understanding of natural population fluctuation.

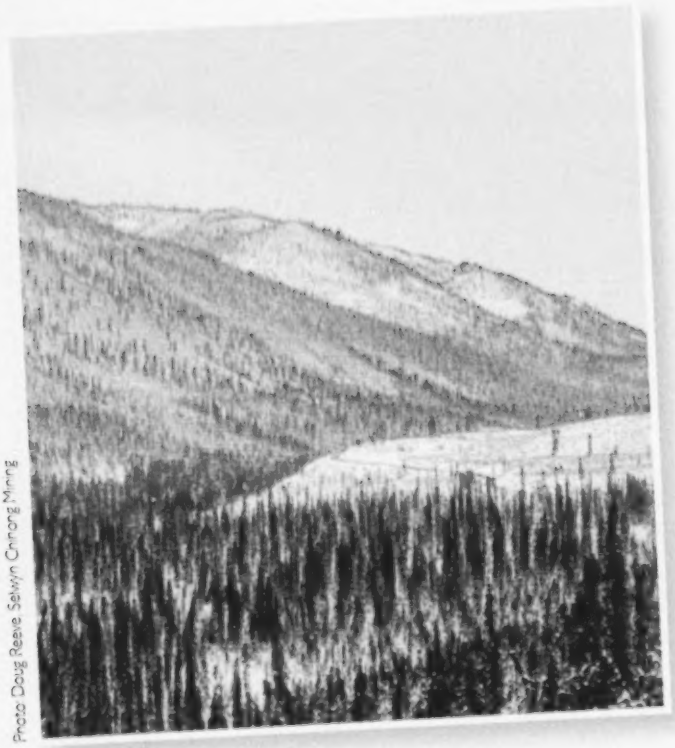

Photo: Doug Reeve, Selwyn Chihong Mining

Surveying the Selwyn area for moose and caribou

Photo: Doug Reeve, Selwyn Chihong Mining

Howard Pass access road

LONG-TERM PLANS AND RECOMMENDATIONS:

At this time SCML plans to replicate the late-winter, post-calving and rut count surveys to strengthen the information base for these life cycle periods. Annual caribou rut counts carried out cooperatively with responsible management agencies will greatly aid well informed decision making for the conservation of the Nahanni caribou herd.

COMMUNITY INVOLVEMENT:

SCML has engaged with government regulators, First Nations, and interested persons/communities on information/activities with the Selwyn Project since 2006.

Establishing a CEMP for Wildlife and Wildlife Habitat in the Sahtú

2-4 September 2014

MAIN INVESTIGATOR:

James Hodson, Wildlife Biologist,
Environmental Assessment/Habitat,
Environment and Natural Resources, GNWT

2013-2014 WESTERN NWT BIOPHYSICAL STUDY

LOCATION:

A two and a half day Wildlife Cumulative Effects Monitoring Workshop was held in the community of Fort Good Hope from 2-4 September, 2014.

PARTNERS:

- Workshop participants included members of the Sahtú Environmental Research and Monitoring Forum (including representatives from the Sahtú Renewable Resources Board, Norman Wells Renewable Resources Council (RRC), Déljne RRC, Fort Good Hope RRC, ENR, Sahtú Secretariat Inc.), delegates or staff members of the Fort Good Hope RRC, the Sahtú Land Use Planning Board, the Sahtú Land and Water Board, the Yamoga Land Corporation, and elders from the community of Fort Good Hope. A full list of participants is provided in the workshop summary report.
- The workshop was facilitated by Todd Sasaki of Tait Communications. The workshop summary report was drafted by Todd Sasaki with input from James Hodson.
- Dora Grandjambe provided interpretation services.

CONTACT:

James Hodson, Wildlife Biologist,
Environmental Assessment/Habitat
Environment and Natural Resources
P.O. Box 1320, Yellowknife, NT X1A 2L9
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RATIONALE:

Shale oil exploration activity and proposed infrastructure development within the Sahtú settlement area of the NWT has created strong interest among community members, renewable resource board and councils, Government and industry proponents to monitor the cumulative effects of these activities on wildlife and wildlife habitat. Many environmental research and monitoring programs are already underway in the Sahtú Region, however greater coordination among research and monitoring efforts, clear identification of monitoring priorities, and input from communities is needed to address cumulative effects. Monitoring cumulative effects on wildlife at an appropriate geographic scale will also require the development of collaborative and standardized approaches to monitoring so that data can be pooled among all monitoring program participants.

OBJECTIVES:

The intent of this workshop was to build off work completed by the Sahtú Environmental Research and Monitoring (ERM) Forum in January 2014, to identify environmental research and monitoring priorities for the Sahtú. The three main objectives of the workshop were to:

- identify any new research or monitoring concerns related to wildlife and wildlife habitat;
- prioritize wildlife-related research and monitoring questions; and
- build consensus around preferred methods used for research and monitoring.

METHODS:

The 34 wildlife-related research and monitoring questions originally identified by the Sahtú ERM Forum in January 2014 were grouped according to 12 common themes and reviewed by workshop participants to identify any new concerns within each theme. The new extended list of 62 research and monitoring questions was then evaluated against four different criteria by break-out groups to rank each question according to its importance on a 1 to 5 scale. A general discussion of wildlife concerns relative to a 5th criterion with a break-out group consisting of elders from Fort Good Hope also took place. Scores for each research and monitoring question were then summed across groups and the list of research and monitoring questions was sorted in descending order of combined score from highest to lowest. Research and monitoring questions with a combined score of 16 or higher were again grouped into broad themes and workshop participants were asked to provide input about how each question/concern could be researched or monitored using either science- or traditional knowledge-based approaches.

RESULTS AND MAIN CONCLUSIONS:

There were eight wildlife questions/concerns that each of the four break-out groups consistently ranked as very important (i.e., a score 5 out of 5). Five out of the top ten concerns were related to education for wildlife harvesters, and harvest monitoring (both Aboriginal, resident and outfitter harvest). The remaining questions/concerns in the top ten included impacts of landscape change due to development and climate on wildlife, interrelationships among caribou populations, protection of habitat corridors for boreal caribou and moose calving areas, and contamination of food for wildlife (vegetation) from flaring and forest fires. A full list of the research and monitoring questions ranked by relative importance can be found in the workshop summary report.

LONG-TERM PLANS AND RECOMMENDATIONS:

The report and outcomes from the workshop can be used by ENR and others to inform the development of proposals for monitoring cumulative effects on wildlife and wildlife habitat in the Sahtú region in the coming years. It is recommended that the prioritized list of wildlife-related research and monitoring questions from this workshop be evaluated against existing research and monitoring programs to identify gaps in current programming and opportunities for collaboration and standardization.

COMMUNITY INVOLVEMENT

The Wildlife Cumulative Effects Monitoring workshop included participants representing the organizations listed above from the communities of Tulít'a, Déljne, Norman Wells and Fort Good Hope. The wildlife research and monitoring concerns and questions raised by community members at the workshop are captured in the workshop summary report. Research and monitoring concerns/questions were ranked by break-out groups consisting of participants from the organizations and communities listed above.

Wildlife Monitoring – Enbridge Right of Way

18 January 2013 – 30 March 2014

MAIN INVESTIGATOR:

Anne Marie Tout, Senior Manager Northern Region, Enbridge Pipelines (NW) Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500198

LOCATION:

The program was conducted as follows:

Enbridge Right of Way (Kp 78-132, Kp 444-510 and Kp 632-672).

PARTNERS:

- Tulít'a Renewable Resources Council
- Liidlii Kue First Nation
- Samba K'e Dene Band

CONTACT:

Ann Marie Tout, Senior Manager Northern Region
Enbridge Pipelines (NW) Inc.
P.O. Box 280
Norman Wells, NT X0E 0V0
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(F) (867) 587-5001
(E) annemarie.tout@enbridge.com

RATIONALE:

The wildlife monitoring program is an annual program at the request of the communities.

OBJECTIVE:

- To support and encourage community-based programs to document wildlife sightings and wildlife tracks along the Enbridge Right of Way.

METHODS:

Monitors traveled the Right of Way by snowmobile and documented their observations of wildlife tracks.

RESULTS AND MAIN CONCLUSIONS:

The reports from the participants were submitted to the Wildlife Management Information System for data entry. No other reports will be produced.

LONG-TERM PLANS AND RECOMMENDATIONS

Pending permitting approvals, this program will continue on an annual basis.

COMMUNITY INVOLVEMENT

The program was completed by community members.

Baseline Wildlife and Habitat Assessment for Husky Oil Operations Limited – EL494 (EL462 and EL463)

25 June 2013 – 25 June 2014

MAIN INVESTIGATOR:

Darren Heck, Environmental Project Manager,
Northern EnviroSearch (Tulít'a) Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500173

LOCATION:

Southeast of Norman Wells and southwest of Tulít'a in Husky EL494.

PARTNERS:

- Northern EnviroSearch (Tulít'a) Ltd. (NESTL)
- Norman Wells Renewable Resources Council
- Tetlit Gwich'in Renewable Resources Council

CONTACTS:

Darren Heck, Environmental Project Manager
Northern EnviroSearch (Tulít'a) Ltd.
1010, 600 – 6 Avenue SW
Calgary, AB T2P 0S5
(P) (403) 543-5353
(F) (403) 233-2513

Corey Linnen, Principal Biologist
Northern EnviroSearch (Tulít'a) Ltd.
104-108 Research Dr.
Saskatoon, SK S7N 3R3
(P) (306) 373-1110

RATIONALE:

The wildlife study and habitat assessment was conducted to collect baseline data on wildlife and habitat in EL494. Data collected through the continuation of this baseline study will allow for the assessment of project effects on wildlife and also future monitoring of the effects of ongoing activity on wildlife in EL494.

OBJECTIVES:

- To collect baseline data on relative abundance of wildlife species at risk and important economic and cultural species.
- To map habitat types and assess the suitability of these habitats for each targeted species.
- To use the assessment of habitat suitability to identify important areas for species at risk and important economic and cultural species.
- To assess and monitor potential project effects on species at risk and important economic and cultural species.

Photo: Northern Enviroseach (Tulít'a) Ltd

Fyke net set at EL494.

Photo: Husky Oil Operations Ltd.

Northern pike found at EL494.

METHODS:

Baseline wildlife relative abundance data was collected through a combination of:

- Forty – 1,000 m winter track surveys conducted in March 2014;
- Forty trail cameras placed along man-made and naturally-occurring linear corridors;
- Assisting the Department of Environment and Natural Resources (ENR) with set-up of bat station and recorder near the Slater River;
- Denning surveys conducted in fall of 2013 along the proposed all-season road;
- Collecting data on vegetation composition and biophysical characteristics within 20x20 m plots in 2012/2013;
- Creation of a digitized ecological land classification; and
- Habitat suitability assessment using the land classification, literature and survey results.

Photo: Husky Oil Operations Ltd

Wolves traveling through the camera trap survey area.

RESULTS AND MAIN CONCLUSIONS:

A baseline report, including habitat suitability modelling results, was produced from the habitat assessments, winter track survey data and camera survey data. Due to permitting delays for the June 2013 pellet group survey this aspect of the program could not be completed.

Winter snow track surveys: Snowshoe hare was the most commonly encountered species, with the highest density of occurrence in deciduous forest and regenerating deciduous forest. Canada lynx track density differed between mixed wood and black spruce habitat, with the latter containing a lower density. The highest average track density for moose was recorded in the deciduous habitat type. Caribou tracks were recorded in three of the habitat types; the highest track density occurred in wetland habitat. Regenerating black spruce habitat contained the highest track density of American marten.

Camera Trap Survey: Across all 40 cameras a total of 16,122 photos have been taken over 13,732 camera days since this study was initiated in 2013. Sixteen species were observed by the 40 camera traps, of which snowshoe hare were the most commonly observed followed by woodland caribou, moose, Canada lynx, black bear and wolf. Of the sixteen species, seven were observed along 2D seismic lines, ten were observed along 3D seismic lines, eleven on winter roads, six on all-season access roads, and eight on natural corridors. The high activity seen on the winter road is likely due to the abandonment of the southern section of this road in winter 2013/2014.

Bat Station Assistance: Husky assisted ENR in collecting the AnaBat recorder in July 2013. Analysis of the data by ENR has not been finalized.

Denning Survey: We observed no evidence of late-fall habitat use, pre-denning or denning activity over two surveys conducted in late October and mid-November of 2013. Trail cameras placed along natural, seismic, and road corridors in February 2013 recorded use of the project area by black bear from late winter, spring and summer of 2013. Four grizzly bears were recorded during the camera survey in 2013 within the Husky exploration lease.

Land Classification and Habitat Suitability Modelling: There are higher levels of moderate quality habitat within the study area than high and very high quality habitat for boreal woodland caribou. Disturbances such as burned areas and 3D seismic resulted in the greatest reduction in habitat quality. There is a larger proportion of high quality habitat for moose within the study area than there is for caribou, with the highest occurring along willow flats on the shores of the Mackenzie and along creeks and drainages. Disturbances such as burned areas and edge creation resulted in the greatest increase in habitat quality for moose. High quality habitat for marten is present throughout the study area. Human disturbance caused little change in habitat quality for marten, while burned areas reduced habitat quality indicating a loss of suitable forest stand structure for this species. There are patches of high quality habitat for lynx in the study area, which were strongly associated with habitat quality of their primary prey species, snowshoe hare. Low quality habitat increased with the creation of travel corridors with disturbances such as seismic lines.

Grizzly bear at EL464 camera survey area

LONG-TERM PLANS AND RECOMMENDATIONS:

Plans are to continue the study in EL494 (previously EL462 and EL463), including bird, waterfowl, pellet group, camera, habitat, fall denning, and winter track surveys. Recommendations include use of standard survey protocols across all land parcels to allow potential future larger-scale regional trends on the effects of the increasing development on wildlife to be identified.

COMMUNITY INVOLVEMENT:

Community involvement included providing food, accommodation, transportation and logistical support to NESTL staff, and assisting field crews in the collection of data. A local community member assisted each crew during each of the surveys including winter track, camera, denning, vegetation and bat station placement.

Photo: Husky Oil Operations Ltd.

Wildlife Monitoring Program for the Diavik Diamond Mine

25 June 2013 – 24 June 2014

MAIN INVESTIGATOR:

David Wells, Superintendent Environment,
Diavik Diamond Mines (2012) Inc.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500171

LOCATION:

The wildlife monitoring program was conducted in the Diavik Diamond Mines (2012) Inc. (DDMI) wildlife study area, centered around Lac de Gras, NWT.

PARTNERS:

- ERM Rescan
- Golder Associates Ltd.
- Dominion Diamond Corporation – Ekati Diamond Mine
- University of Northern British Columbia

CONTACT:

David Wells, Superintendent Environment
Diavik Diamond Mines (2012) Inc.
P.O. Box 2498
Yellowknife, NT X1A 2P8
(P) (867) 669-6500 ext. 5536

RATIONALE:

To monitor wildlife within the vicinity of the mine.

OBJECTIVES:

- To verify the accuracy of the predicted effects determined in the *Environmental Effects Report (Wildlife 1998) and the Comprehensive Study Report (June 1998)*.
- To ensure that management and mitigation measures for wildlife and wildlife habitat are effective in preventing significant adverse impacts to wildlife.

METHODS:

Depending on species, various methods were used to collect the appropriate information that will assist DDMI in verifying predicted effects and determine the effectiveness of mitigation measures.

Barren-ground Caribou: behavioral scan surveys, road and infrastructure surveys and incidental observations.

Grizzly Bear: incidental observations and year two of the grizzly bear hair snagging DNA program was completed in conjunction with the Ekati Diamond Mine under wildlife research permit WL500169.

Wolverine: snow track surveys, and incidental observations.

Waterfowl and Other Aquatic Birds: ground based surveys.

Raptors: ground based monitoring for nesting locations of open pits and mine infrastructure nesting, incidental observations.

Windfarm: bird mortality monitoring was conducted at the windfarm following the *Avian Post-Construction Follow-up Plan*.

RESULTS AND MAIN CONCLUSIONS:

Barren-ground Caribou: A total of 90 ground based behavioral surveys were completed in 2013 ranging from <2 km to >30 km from the mine. One natural (wolf kill) caribou mortality occurred at the mine in 2013.

Grizzly Bear: 67 incidental sightings of grizzly bears were recorded at the mine in 2013. One bear was relocated offsite by ENR in August. No bear mortalities occurred at the mine in 2013.

Wolverine: Three incidental sightings of wolverine were recorded at the mine in 2013. Twenty-six observations of wolverine tracks were noted during the track survey (April 2-6), resulting in a track index of 0.17 tracks/km. No wolverine mortalities occurred at the mine in 2013.

Waterfowl and Other Aquatic Birds: Water birds are utilizing mine-altered waters, particularly the North Inlet, but not earlier than the East and West Shallow Bays.

Raptors: Two rough legged hawk nests were identified in the A418 open pit, and a peregrine falcon nest was located on a high wall behind the site services building. One common raven and two peregrine falcon mortalities occurred at the mine in 2013.

Windfarm: No bird carcasses were observed during the monitoring program.

LONG-TERM PLANS AND RECOMMENDATIONS:

DDMI has been working collectively with the GNWT and our stakeholders to review existing wildlife programs and determine areas for improvement. DDMI continues to visit our community stakeholders to inform them of the results and status of the current programs.

COMMUNITY INVOLVEMENT

Northern residents will continue to be an integral part of the wildlife monitoring program in the Lac de Gras area by providing assistance, local knowledge, and a northern perspective to the program. This will assist in incorporating local participation and knowledge from different communities into the various monitoring programs, as well as providing an opportunity for community members to work on the land and better understand mining developments.

In 2013, DDMI hired two seasonal Aboriginal Environment Technicians.

Members of the North Slave Métis Alliance and Tłı̨cho conducted caribou behavioral surveys.

Photo: Diavik Diamond Mines (2012) Inc.

Wolverine tracks

Wildlife Effects Monitoring Program

15 July 2013 – 15 July 2014

MAIN INVESTIGATOR:

Claudine Lee,
Superintendent Environmental Operations,
Dominion Diamond Ekati Corporation

WILDLIFE RESEARCH PERMIT NUMBER:

WL500167

LOCATION:

The Ekati Diamond Mine, owned and operated by Dominion Diamond Ekati Corporation (DDEC), is located in the Slave Geological Province of the NWT, approximately 150 km north of the treeline between Yamba Lake and Lac de Gras. The predominant vegetation type in the region is heath tundra with several large eskers in the study area providing predominant travel routes for caribou and denning habitat for wolves and grizzly bears.

PARTNERS:

- Yellowknife Dene First Nation
- Łutselk'e Dene First Nation
- Tłı̨cho
- Kitikmeot Inuit Association
- North Slave Métis Alliance

CONTACT:

Harry O'Keefe, Environment Advisor – Wildlife
Environment and Communities
Dominion Diamond Ekati Corporation
1102 4920 52nd Street
Yellowknife, NT X1A 3T1
(P) (867) 880-2390
(F) (867) 880-4012

RATIONALE:

The wildlife effects monitoring program (WEMP) is a requirement of DDEC's environmental agreement (Articles V and VII). The WEMP is based on environmental impact statements and predictions that led to a series of monitoring objectives and subsequent studies which, with community input, were designed to determine whether mine activities have effects on wildlife and/or wildlife habitat. The WEMP also includes monitoring programs that can be used to measure the effectiveness of mitigation measures.

OBJECTIVES:

In order to monitor the environmental impact predictions and potential effects on valued ecosystem component (VEC) species, and to address key residual environmental risks to wildlife as identified in the environmental impacts review process, there are eight main objectives for the WEMP:

- To monitor caribou;
- To monitor carnivores, including grizzly bears, wolves, wolverine, and foxes;
- To monitor upland breeding birds and raptors;
- To monitor interactions between wildlife and traffic, and assess success of mitigation efforts;
- To monitor wildlife mortalities and incidents and assess the effectiveness of mitigation efforts;
- To monitor potential wildlife attractants and assess the effectiveness of waste management efforts;
- To inspect buildings (i.e., accommodation skirting) and fencing structures at the DDEC and Misery camps for evidence of interaction with or disturbance by wildlife; and
- To monitor wildlife interactions with the Long Lake containment facility.

Photo: Dominion Diamond Ekati Corporation

Barren-ground caribou crossing near Contwoyto Lake.

METHODS:

WEMP uses scientific methodology and traditional knowledge to design monitoring programs and as a source of information regarding wildlife and local ecology. DDEC employs four wildlife technicians, a consultant wildlife biologist and an environmental advisor dedicated to the wildlife program. WEMP focuses on wildlife species and habitats that were identified during the environmental assessment review process (EARP) as being of social or economic importance or of particular ecological or conservation concern. Wildlife effects are defined as changes to a VEC due to human activities (BHP Billiton 2003). A wildlife effect is not necessarily a negative impact; an effect may also be neutral or positive.

RESULTS AND MAIN CONCLUSIONS:

Habitat Alteration and Loss: 21.63 ha of additional surface area of habitat were disturbed due to mine development and operations.

Wildlife-vehicle Encounters: 26 vehicle-related animal mortalities were reported. None of the vehicle-related mortalities were caribou or other VEC species; however, there was one incident of vehicle-related mortality for a species at risk (short-eared owl). Other mortalities reported included eleven Arctic hares, five ptarmigan, four Arctic ground squirrel, three greater white-fronted geese, one fox, and one common raven.

Non-vehicle Wildlife Incidents and Mortalities: ten non-vehicle related wildlife mortalities occurred, including one caribou, one fox, and eight birds. The caribou mortality was in the vicinity of Grizzly Road, and appeared to be caused by wolves.

Caribou

Numbers of Caribou in the Ekati Diamond Mine Study Area: observers estimated 2,653 caribou within the study area. Overall, caribou abundance and timing of migrations through the study area have been relatively consistent over the previous 16 years. Approximately 2/3 of these animals were observed during the northern and southern migration periods.

Caribou Behaviour

Activity Budgets and Response to Stressors: behaviours of 25 individual caribou were observed near the DDEC. Caribou spent the majority of their time (74% for females; 83% males) feeding, bedded, or standing. Results are consistent with those observed in 2011 and 2012, which suggests some level of tolerance for areas in proximity to the mine.

Grizzly Bears: 52 incidental observations totaling 59 grizzly bears. The first spring sighting was on May 18, 2013, and the last grizzly bear sighting prior to winter was recorded on November 7, 2013.

Wolves: 55 incidental observations of 71 wolves. Overall, wolf presence within the DDEC area has been relatively consistent over the last 12 years, with a mean pup production of five pups per year and two pups per den.

Foxes: 189 incidental observations of 209 foxes recorded on 114 separate days. It is important to note that this does not indicate that 209 individual foxes were observed, as several of these observations could have been the same individual foxes recorded on multiple occasions.

LONG-TERM PLANS AND RECOMMENDATIONS:

WEMP is an annual report and will continue to be reviewed and produced through consultation with First Nations and regulators.

COMMUNITY INVOVLEMENT:

WEMP was developed and will continue to be adapted, through extensive consultation with stakeholders, including regulators, scientists and Aboriginal people.

Photo: Dominion Diamond Ekati Corporation

Female wolf observed near Misery Road.

De Beers Snap Lake Mine
Annual Wildlife Effects Monitoring Program

1 January 2014 – 31 December 2014

MAIN INVESTIGATOR:

Alex Hood,
Environmental and Permitting Superintendent,
Snap Lake Mine;
Michelle Peters
Environmental Monitoring Superintendent,
Snap Lake Mine

WILDLIFE RESEARCH PERMIT NUMBER:

WL500201

LOCATION:

The study area is defined by a radius of 31 km from the center of the Snap Lake Mine. The nearest community is Łutselk'e. The approximate boundaries of the study area are:
north boundary 63° 52'00"N and 110° 53'00"W,
east boundary 63° 35'05"N and 110° 10'14"W;
south boundary 63° 18'30"N and 110° 53'00"W,
west boundary 63° 35'05"N and 111° 30'00"W.

PARTNER:

- University of Calgary (grizzly and black bears)

CONTACT:

Alexandra Hood, Environmental and Permitting Superintendent
De Beers Snap Lake Mine
300-5120 49th Street
Yellowknife, NT X1A 1P8
(P) (867) 766-7308

RATIONALE:

De Beers have been collecting wildlife data for the Snap Lake area since 1999. The wildlife effects monitoring program is a requirement of the mine's environmental agreement (Article VII, 7.2c) and land use permit (Condition 36). A wildlife effects monitoring plan (WEMP) was prepared for the Mine in 2004. The program is designed to detect, monitor, and measure environmental effects that may impact wildlife habitat, changes to wildlife behaviour and distribution, and wildlife mortalities associated with the mine activities. The annual monitoring program is intended to provide information for the mine's environmental management system (EMS) to adaptively manage the mine to protect wildlife and wildlife habitat, and to contribute to regional monitoring information that may then be used to assess cumulative effects of mining on wildlife.

Map: Kelly Bourassa, Golder Associates

Snap Lake wildlife effects monitoring program study area

OBJECTIVES:

To obtain and determine annual variability of:

- relative abundance, distribution, group composition and behaviour of caribou;
- relative activity of grizzly bears;
- relative activity of wolverines;
- presence and production of wolves; and,
- presence and production of falcons nesting in the study area.

METHODS:

All studies will take place within a study area of 31 km radius from the Snap Lake Mine.

Caribou aerial surveys, along established transects, spaced 8 km apart, to monitor caribou abundance, distribution, group composition, and behaviour.

Ground surveys of caribou to document their behaviour.

Grizzly bear hair snagging surveys at established plots to document activity of grizzly bears.

Wolverine hair snagging surveys at established plots.

Helicopter survey for active wolf dens to monitor presence and production of wolves.

Aerial surveys of historically active falcon nests to monitor the presence and productivity of peregrine falcons and gyrfalcons.

Incidental observations of wildlife at the mine site will be recorded.

RESULTS AND MAIN CONCLUSIONS:

All results are discussed in the annual WEMP, and Wildlife and Wildlife Habitat Protection Plan (WWHPP) annual reports were submitted March 31, 2014. Please see the 2013 WEMP and WWHPP reports for more details on results from 2013.

Photo: Kelly Bourassa, Golder Associates

Lynn Nguyen baits a wolverine hair snagging post.

LONG-TERM PLANS AND RECOMMENDATIONS:

De Beers annually submits the results of the WEMP to ENR and the other parties of the environmental agreement. Periodically De Beers prepares a data analysis report instead of the annual report. The data analysis report includes reporting for that year and in addition a review of all past years of data. In 2013 De Beers submitted the report *Snap Lake Mine: Analysis of Environmental Effects on Wildlife 1999 to 2012*. The 2014 WEMP Annual Report will be submitted in 2015.

COMMUNITY INVOLVEMENT:

The Snap Lake project has had an ongoing community consultation program since 1998. It is the intent of De Beers to continue this dialog during the life of the mine. Discussions held to date include meetings with the Yellowknives Dene First Nation, Tłı̨cho Government, the North Slave Métis Alliance, and the Łutselk'e Dene First Nation. Consultation has focused on updating the communities on the activities at Snap Lake and the program results to-date, arranging for site visits by community members (if desired), and including members as assistants in field programs where possible. Discussions regarding traditional knowledge began in 2000 and this input was reflected in this program's study design.

Baseline Wildlife Studies for the Fortune Minerals Limited NICO Project

7 March 2014 – 31 December 2014

MAIN INVESTIGATOR:

Daniel Coulton, Wildlife Biologist,
Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500218

LOCATION:

The regional study area (RSA) for wildlife studies is defined by a radius of 15 km from the NICO project camp on Lou Lake, NWT (63° 33'N, 116° 47'W) and a 5 km buffer on either side of the proposed NICO project access road (NPAR). The project is approximately 50 km northeast of Whatì and 22 km west of the Snare Hydro Plant.

PARTNER:

- Fortune Minerals Ltd.

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RATIONALE:

Baseline studies will be completed to augment existing information on wildlife species and habitat surrounding the project and the NPAR. Data obtained will be used to predict and mitigate effects to wildlife from project development, provide pre-development information in support of a future environmental effects monitoring program, and contribute to regional studies for assessing and managing potential cumulative effects.

OBJECTIVES:

- To further describe the occurrence, relative abundance, distribution, and habitat use of wildlife in the study area.
- To predict effects to the environment and wildlife from project development.
- To provide baseline data for testing environmental effects predictions and the effectiveness of mitigation.
- To guide further mitigation and adaptive management for reducing unexpected effects.

METHODS:

Ungulate surveys: up to four aerial surveys for caribou and moose will be completed on existing transect lines within the RSA. One to two surveys will be completed between January and May, and a further one or two surveys are expected for November and December. Observers will record caribou and moose numbers, distribution, behaviour, group size and composition, habitat type, and snow track densities. The aerial surveys will be completed with a Found Bush Hawk, or Turbo Beaver fixed wing aircraft, at an altitude of approximately 120 m AGL. Flight speeds will average 150 kph.

Raptor nest surveys: a wide range of raptors (eagles, hawks, falcons, and owls) have been observed in the RSA. A helicopter will be used to visit the known raptor nests within the RSA. The survey will take place in early June to identify which nests are occupied, and again in July to count the number of young in each nest. Nests will be surveyed using a quick fly-by to minimize disturbance. The survey will not occur if there is rain, snow, or strong winds that may cause eggs or chicks to cool.

Count and location of incidental observations of wildlife will be recorded during all surveys.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Baseline Wildlife Studies for the De Beers Canada Gahcho Kué Mine

27 February 2014 – 31 December 2014

MAIN INVESTIGATOR:
Golder Associates Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:
WL500217

LOCATION:
The Gahcho Kué Mine is approximately 280 km northeast of Yellowknife and 140 km northeast of Łutselk'e.

PARTNER:
- De Beers Canada Inc.

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RATIONALE:
Wildlife studies were completed to augment existing information on wildlife species and habitat surrounding the mine.

OBJECTIVES:
- To further describe the occurrence, relative abundance, distribution, and habitat use of wildlife in the study area.
- To provide data for testing environmental effects predictions and the effectiveness of mitigation.
- To guide ongoing mitigation and adaptive management.

METHODS:
De Beers conducted a caribou behavioral monitoring program along the winter access road using group scans and focal surveys.

RESULTS AND MAIN CONCLUSIONS:
This program took place between February 15 and March 8, 2014 and was undertaken by biologists, environmental scientists and Aboriginal community monitors. Observations were made on 27 caribou groups. Responses to ambient stressors such as trucks, airplanes or natural factors were recorded. A further 63 caribou groups were monitored for behavior using group scans. The most common behaviours observed were bedded (45.3%) and feeding (34.6%), followed by walking (15.2%), standing (4.8%), alert (0.9%) or trotting/running (1.1%).

A total of 114 wolverine hair snagging posts were distributed in a 1,500 km^2 area surrounding the Gahcho Kué Mine in 2014. Posts were spaced approximately 5 km apart. Posts were surveyed for hair over two intervals, approximately ten days apart, between March 28 – May 5. A total of 125 hair samples were collected from the Gahcho Kué study area. The hair snag samples will be analyzed by Wildlife Genetics International and the results will be summarized in the annual wildlife report. Results will also be submitted to the Department of Environment and Natural Resources (ENR) to incorporate into their regional analysis.

A total of 64 grizzly bear hair snagging stations were distributed by one biologist and one Aboriginal community monitor in a 9,216 km^2 area surrounding the Gahcho Kué Mine in 2014.

Each station was surveyed six times, every 10-14 days, between June 19 – September 4. A total of 844 hair samples were collected. In addition, over 2,000 photos of vegetation cover were taken as part of a graduate research project quantifying the vegetative cover in different habitat types relative to grizzly occurrence. This work will contribute to the ground-truthing of satellite images at 164 geo-referenced sites. All data will be summarized in the annual wildlife report and shared with ENR as part of the regional study of grizzly bears.

De Beers contributed to ENR monitoring programs supporting the *Barren-ground Caribou Management Strategy*, participated in the zone of influence task team, and conducted a pilot program to investigate the behavioral responses of caribou to the winter road.

LONG-TERM PLANS AND RECOMMENDATIONS:

Wildlife monitoring will continue throughout the life of the mine according to the Wildlife and Wildlife Habitat Protection Plan and the Wildlife Effects Monitoring Program.

COMMUNITY INVOVLEMENT:

De Beers is actively involved in community engagement activities. Updates on wildlife studies are regularly provided to the surrounding communities. Each wildlife study in 2014 was implemented with the assistance of Aboriginal community monitors drawn from North Slave communities. Monitors were hired based on their knowledge of the study area, ability to work as field technicians and/or interest in wildlife surveys. Monitors included Joseph Catholique, Maurice Boucher and Roy Desjarlais.

Courageous Lake Project: Wildlife Baseline Summary Report

16 June 2014 – 1 May 2015

MAIN INVESTIGATOR:

Dr. Gregory Sharam, Partner,
Wildlife Department Manager, ERM Rescan

WILDLIFE RESEARCH PERMIT NUMBER:

WL500269

LOCATION:

The Courageous Lake project (Project) is owned by Seabridge Gold Incorporated and is located south of Courageous Lake at latitude 64° 05'N and longitude 111° 15'W about 240 km northeast of Yellowknife, NWT.

Wildlife baseline studies were conducted in mid-June, within the local study area (LSA) and regional study area (RSA) of the Project.

PARTNERS:

Little field work was conducted for the Project in 2014, and there were no partners for this work. ERM Rescan has involved members of the Yellowknives Dene First Nation in the collection of wildlife data in the past (2011 and 2012).

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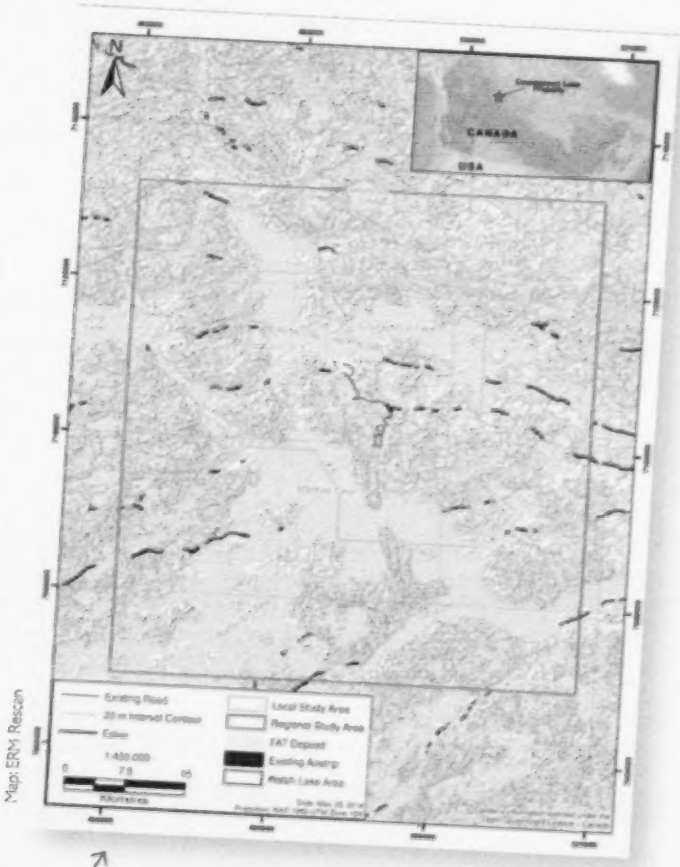
RATIONALE:

Baseline studies were conducted to provide a reference point for future monitoring studies and allow the evaluation of potential effects of the Project.

OBJECTIVES:

- To examine the distribution and abundance of caribou (and other wildlife) in the LSA and RSA with use of remote cameras (Reconyx PC800 professional digital cameras).



Courageous Lake Project Area and Wildlife Study Areas.

METHODS:

A total of 65 remote cameras were in operation in the LSA and RSA in 2014, 50 of which have been in operation since 2011 and eight of which were deployed in late 2013.

All remote cameras located at the Project were serviced over a period of two days in mid-June, 2014. Servicing included exchanging batteries and memory cards and replacing desiccant to ensure proper function of cameras over the winter until the next camera check to be conducted in 2015.

RESULTS AND MAIN CONCLUSIONS:

The aim of the remote camera study is to continuously monitor for caribou and other wildlife passing through the general area of the Project.

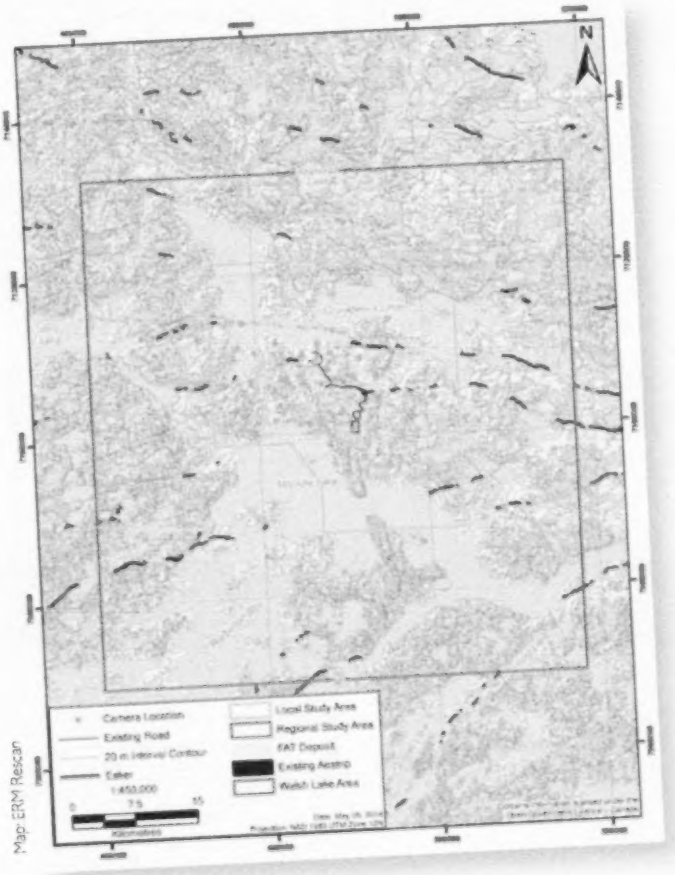
Observation data (in the form of images recorded on camera memory cards) was downloaded in late 2014 and stored in Vancouver. Analysis of caribou and other wildlife recorded by remote cameras will be conducted at a later date and included in a report such as the *Developers Assessment Report (DAR)* for the Project.

LONG-TERM PLANS AND RECOMMENDATIONS:

Remote cameras will continue to be used to non-invasively monitor the presence and seasonal patterns in caribou numbers at the Project.

COMMUNITY INVOLVEMENT:

Data from the remote cameras within the LSA and RSA will be analyzed at a future date, potentially as part of the DAR process for the Project. Results, when available, will be summarized within an annual wildlife baseline report produced for the Project, which will then be distributed to communities as requested.



Courageous Lake remote motion-triggered camera locations.

Former Pointed Mountain Gas Fields Nest Search

20 June 2014 – 31 August 2014

MAIN INVESTIGATOR:

Stephen Symes, Staff Wildlife Ecologist,
WorleyParsons Canada Services Ltd.

WILDLIFE RESEARCH PERMIT NUMBER:

WL500262

LOCATION:

30 km NE of Fort Liard, NWT.

PARTNER:

- Apache Canada Ltd.

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RATIONALE:

As part of the remediation of Pointed Mountain former gas field, a camp is planned to be constructed on the former plant site. The proposed construction is planned to begin within the migratory breeding bird season. Therefore, WorleyParsons is proposing to conduct ground-based wildlife surveys (nest searches) to identify, buffer, monitor, and recommend mitigation measures to reduce the risk of disturbing or destroying identified nests and eggs of migratory birds. The site is previously disturbed and is currently vegetated with grasses. No trees or shrubs are planned to be cleared.

OBJECTIVES:

- To identify nesting locations (if any) of migratory birds at the plant site.
- To identify nesting locations (if any) of at-risk birds at the plant site.
- To determine whether nesting individuals will be negatively impacted by activities relating to the construction of a camp used for future remediation activities.
- To buffer nesting locations with an appropriate species-specific setback based on government recommendations (Canada Wildlife Service guidelines).
- To monitor (if required) nesting birds to ensure construction activities do not negatively impact nesting birds.
- To identify incidental detections of all wildlife encountered.
- To submit list of all wildlife species (including nesting breeding birds) to the NWT wildlife database.

METHODS:

Two biologists utilized the rope drag method, effective at locating bird nests in short grass, cultivated fields and pastures (Higgins et al. 1969, Winter et al. 2003). Surveyors will walk transects dragging a rope with a 30 m "U" shape to promote nesting birds to flush. Surveyors will remain quiet and minimize nest search time (<5 minutes); time at nests will be limited to that required to collect data. If concern that adults have not returned to the nest (or any other concern that the survey is negatively impacting individuals), survey will immediately cease and territorial and federal government biologists will be notified immediately.

RESULTS AND MAIN CONCLUSIONS:

Results and main conclusions were not submitted.

LONG-TERM PLANS AND RECOMMENDATIONS:

Long-term plans and recommendations were not submitted.

Former Pointed Mountain airstrip - bird nest sweep location

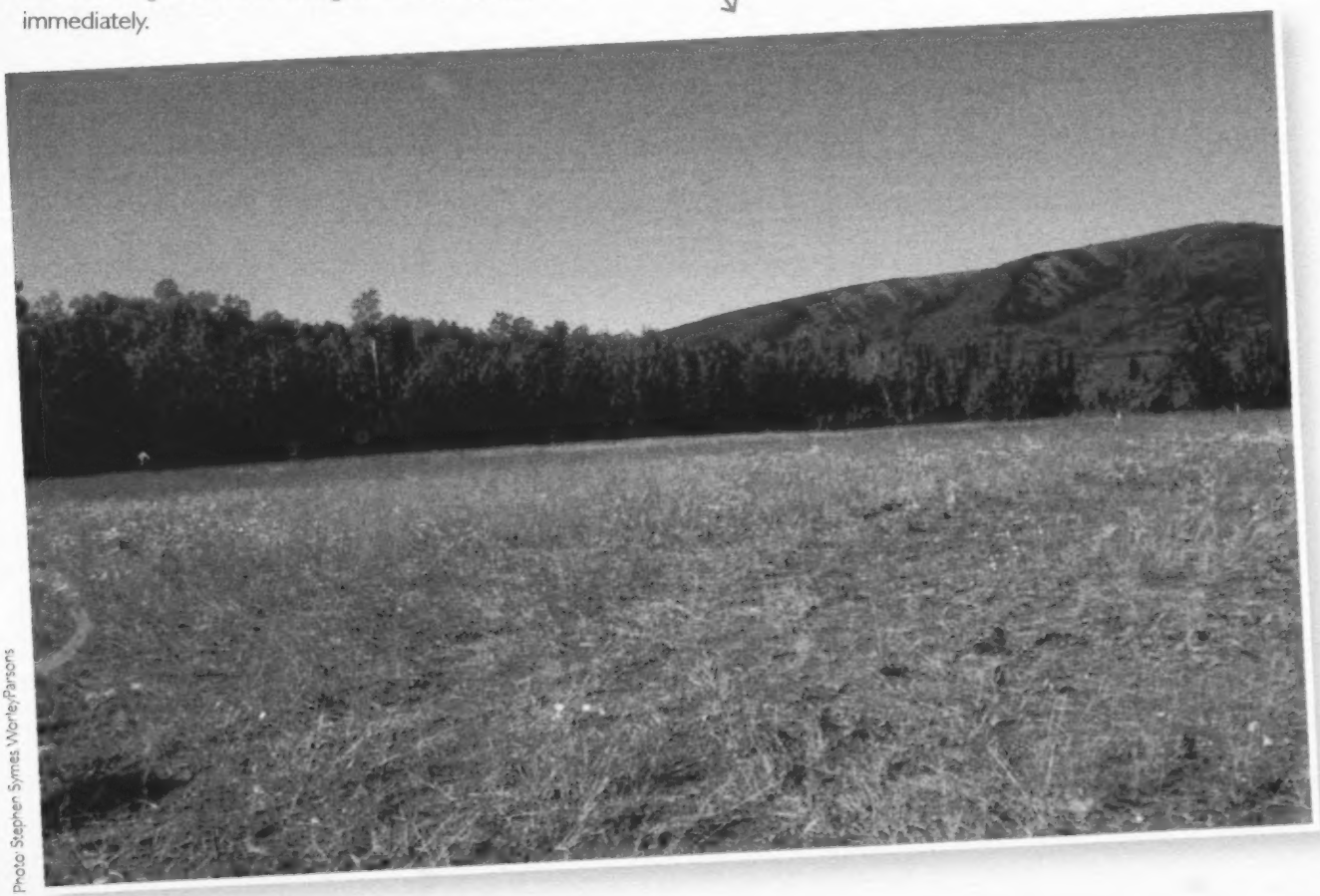

Photo: Stephen Symes Worley/Parsons

Barcode of Life Project in Canada: NWT Volunteer Sites

26 May 2014 – 15 September 2014

MAIN INVESTIGATORS:

Suzanne Carrière (NWT coordinator, HQ ENR), Karl Cox (Fort Smith, South Slave Region, ENR), Stephanie Behrens (Norman Wells, Sahtú Region, ENR), Tracy Davison (Inuvik, Inuvik Region, ENR), Lynda Yonge (Pontoon Lake, HQ ENR), and Kate Perez (Canada Coordinator, Biodiversity Institute of Ontario, University of Guelph), and collaboration with Doug Tate (Virginia Falls, Nahanni National Park Reserve)

WILDLIFE RESEARCH PERMIT NUMBER:

WL500253

LOCATION:

Collection locations and dates were:
Shell Lake, near Inuvik (68.326°N; -133.634°W) – 17 June-27 August 2014;
Norman Wells (65.279°N; -126.830°W) – 28 May-10 September 2014;
Pontoon Lake near Yellowknife (62.534°N; -113.976°W) – 25 May-21 September 2014;
Fort Smith (60.00240°N; -111.90613°W) – 6 June-26 September 2014; and
Virginia Falls, NNPR (under a separate permit in the National Park).

PARTNERS:

- Biodiversity Institute of Ontario, University of Guelph
- Environment and Natural Resources (ENR)
- Parks Canada

RATIONALE:

The use of DNA barcoding has greatly improved large-scale biodiversity assessments by overcoming the limits of traditional species identification. This technique differentiates species by variations in a short gene sequence.

Malaise traps are tent-like structures that are easy to deploy, low cost and effective at capturing insects from various groups. The Biodiversity Institute of Ontario (BIO), University of Guelph, has been conducting multiple Malaise Trap Programs in Canada's environmentally significant areas in collaboration with government organizations for the past two years. This year, ENR assisted BIO in arthropod collections in remote northern locations. The overall aim of the project is to acquire detailed temporal information on terrestrial arthropod communities at key sites across Canada. Additionally, all results from this program will contribute to the Barcoding Canada project, which seeks to create a complete DNA barcode library for all animal and plant species that occur in Canada.

OBJECTIVES:

- Large-scale trapping of arthropods (insects and spiders) in environmentally significant areas across Canada to obtain tissue material and subsequently determine Canadian species diversity using DNA barcoding.
- Over the long term, creation of a complete DNA barcode library for all eukaryote species that occur in Canada.

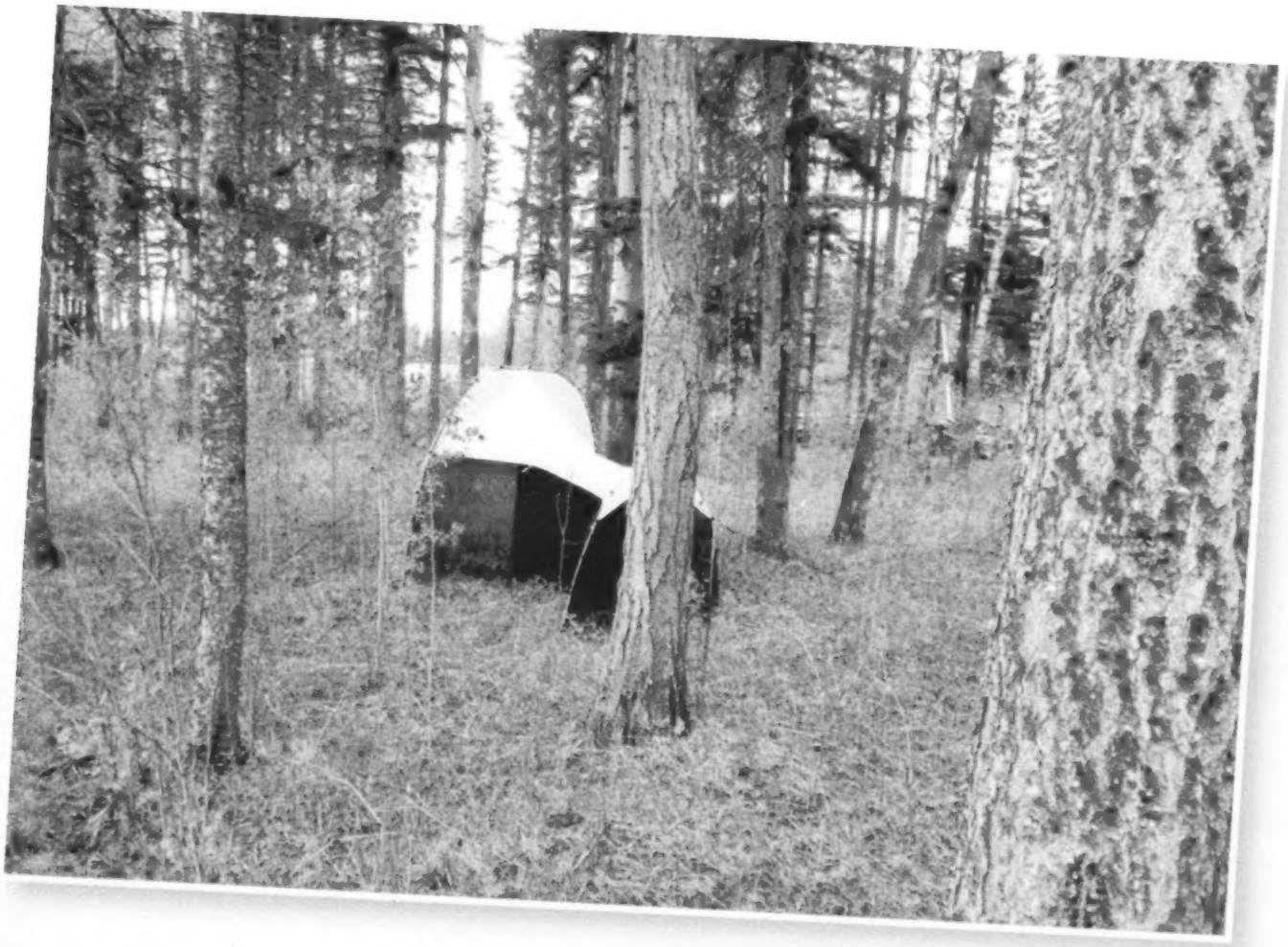

Photo: GNWT/K. Cox, ENR

Malaise trap set up to capture various insects.

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METHODS:

All required equipment and materials (Malaise traps, collection bottles, insect preservative, associated documents including labels and SOP) were shipped from BIO to a location selected by ENR.

One Malaise trap was deployed at each of the sites. Each collection bottle was changed weekly by a volunteer for a total of 15 weeks.

At the end of the field season, all collected samples were shipped back to BIO for processing.

DNA will be extracted from each specimen and individuals will gain a DNA barcode sequence, which enables the assignment of more detailed taxonomic information in the future.

All associated collection data and sequences will be uploaded to the online Barcode of Life Datasystems (BOLD). Barcodes will be assigned a Barcode Index Number (BIN), which represents a unique species and can be compared to the DNA barcode reference library.

RESULTS AND MAIN CONCLUSIONS:

A total of 40 Malaise trap samples were collected from the NWT volunteer sites.

BOLD projects will be created for the samples chosen for processing.

Results and analysis for each site will be completed once processing is finished and reports will be given to ENR.

LONG-TERM PLANS AND RECOMMENDATIONS:

Data will be used to update the lists of arthropods known to exist in the NWT following protocols from the NWT General Status Ranking Program at http://nwtspeciesatrisk.ca/en/GenStatusRanking. Collecting samples from these remote locations will lead to rare and new species barcodes to add to the BOLD reference library. The open-access and digestible format also enables comparisons with other sites and future surveys.

COMMUNITY INVOLVEMENT:

Community members visited some sites and were given a summary of the study objectives. Reports will be shared with the wildlife co-management boards in the NWT.

More information on the reference library's public data portal of BOLD can be found here: www.boldsystems.org/.

Photo: GNWT/P.Lacroix, ENR

Arctic blue butterfly feeding on wild onion nectar.

Dehcho Biennial Regional Wildlife Workshop

April 2014 – March 2015

MAIN INVESTIGATOR:

Nic Larter, Manager Wildlife Research and Monitoring, Environment and Natural Resources, GNWT, Dehcho Region

2013-2014 WESTERN NWT BIOPHYSICAL STUDY

LOCATION:

Delegates from all Dehcho First Nations travel to Fort Simpson for a two day workshop.

PARTNERS:

- Environment and Natural Resources (Dehcho and South Slave Region, and Headquarters)
- Parks Canada
- Bompas Elementary School
- Liidlii Kue First Nation
- Canadian Wildlife Service, Yellowknife
- Wild Sheep Federation

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RATIONALE:

The biennial Dehcho regional wildlife workshop is an important component of the regional wildlife program. The workshop provides updates on all regional wildlife programs to representatives from all Dehcho First Nations (DFN) and the general public and provides a forum that incorporates traditional and scientific knowledge in open discussion. The workshop facilitates open communication, critique and exchange of regional wildlife issues and programs. Biennial workshops have been well supported by First Nations since they began in 2002. This workshop format has been used as a model for communication and consultation between the ENR and First Nations. Similar workshops have been used by other regions.

OBJECTIVES:

- To ensure that delegates of the various DFN receive a complete update and outline of the current and ongoing wildlife programs being delivered by ENR.
- To assess how well ENR has addressed the action items tabled at the previous workshop.
- To provide a forum for other agencies, departments, and/or ENR programs to present research programs and findings.
- To provide a forum for the open discussion of regional wildlife issues facilitating communication between various agencies and First Nations in not only the Dehcho but other regions of the NWT and with regions in bordering jurisdictions.
- To ensure continued dialogue about wildlife research and monitoring between all DFN, ENR, and other agencies.

METHODS:

ENR covers all expenses for up to two delegates from each DFN to attend the workshop. The workshop is open to the public and often many First Nation members in addition to the delegates attend. The workshop covers two days with presentations and discussions. Coffee breaks and catered lunches (by local schools) on site make for a relaxed atmosphere which also facilitates the viewing of many posters and continued less formal discussions amongst attendees. Day one consists mostly of presentations of proposed and ongoing wildlife research programs in the region by various government and non-government organizations. Day one always begins with a presentation critiquing how well ENR has responded over the past two years to the action items tabled at the previous workshop. Day two is mostly open discussion revolving around First Nation concerns, comments and criticisms of wildlife issues, wildlife programs and the presentations made. The day and workshop ends with a consensus on a list of action items for ENR to address over the next two years.

RESULTS AND MAIN CONCLUSIONS:

A well-attended workshop was held in Fort Simpson, 21-22 October, 2014.

ENR research programs were updated, discussed, and critiqued.

Delegates provided suggestions and guidance for ENR research programs.

Research programs by Parks Canada and Canadian Wildlife Service were presented.

A presentation titled *Separation part of the Solution; Disease Transmission from Domestics to Wildlife* was made by a representative of the Wild Sheep Foundation.

Round table discussions of the presentations and various wildlife issues culminated with the tabling of 12 action items, including conducting another workshop in October 2016.

Posters and reports/scientific papers were made available to workshop attendees.

Thomas Simpson School Environmental Stewardship class attended part of the workshop.

A final report of the workshop was circulated in hard copy and digital format and posted on the ENR website.

Digital transcripts of the workshop were made.

LONG-TERM PLANS AND RECOMMENDATIONS:

It is recommended that the current format and timing of regional wildlife workshops continue and another workshop be held in October 2016. We need to continue to promote the exceptional attendance of DFN representatives to this workshop. This was the first workshop that the Thomas Simpson School Environmental Stewardship class participated in. We would like to encourage their participation and that of other youth in future workshops.

COMMUNITY INVOLVEMENT

This workshop is a key forum for representatives from all DFN to comment, critique, and make recommendations on all Dehcho ENR wildlife programs. It is well attended by members of all DFN and the local community. Delegates at the workshop generate action items which are implemented into the appropriate research programs and critiqued as part of the agenda for the next meeting. A local audio company and local translators are hired. Local schools participate as caterers for the event.

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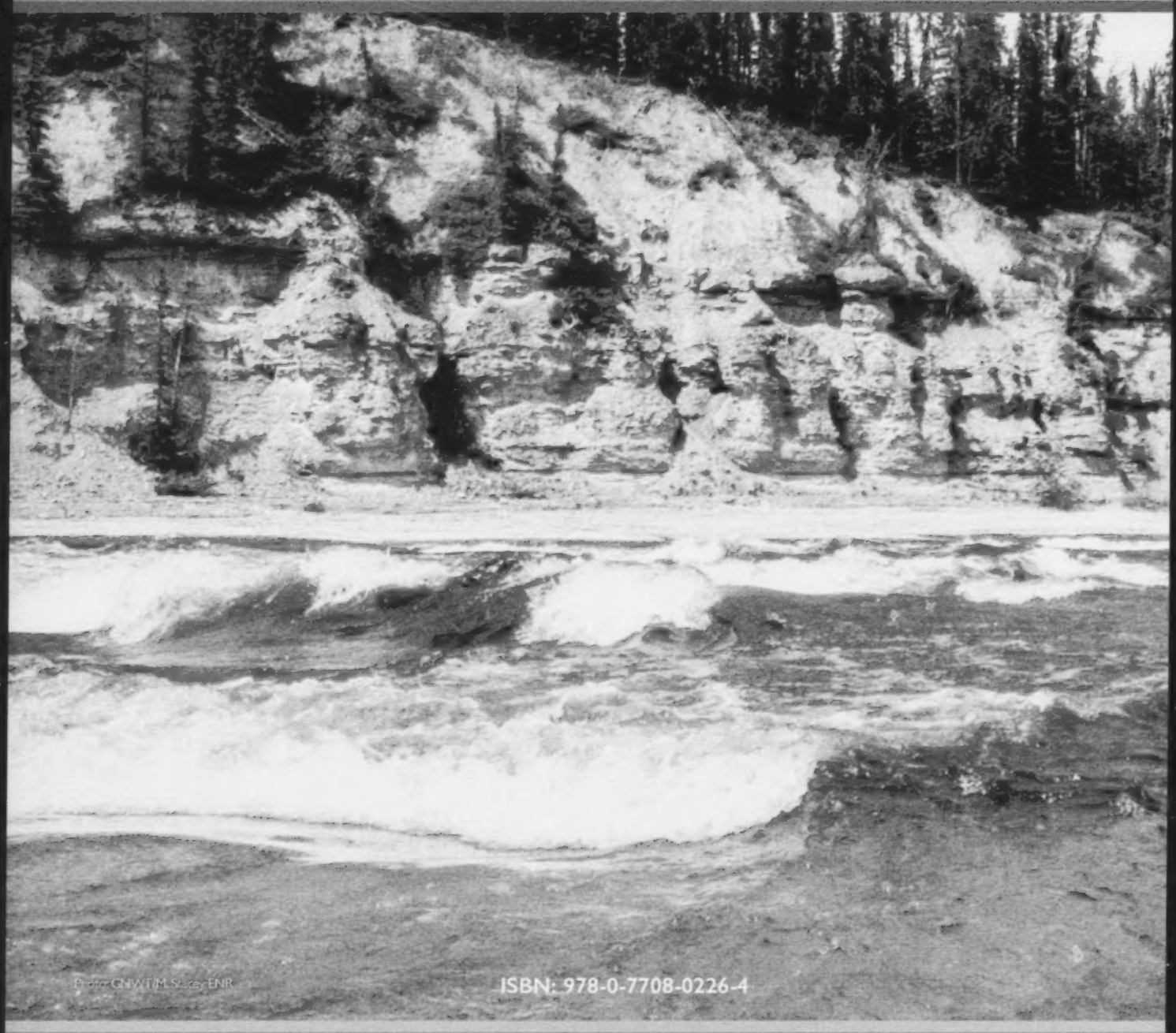

Photo: GNWT/M. Stuckey/ENR

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